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Physiological Characteristics of Uterine Cancer in Relation to Radiation Therapy

Clinical Use of Antibiotics with Special Reference to Penicillin and Streptomycin

Visual Examination for School Children

Lipomas of Large and Small Intestine

Acute Bronchiolitis in Children

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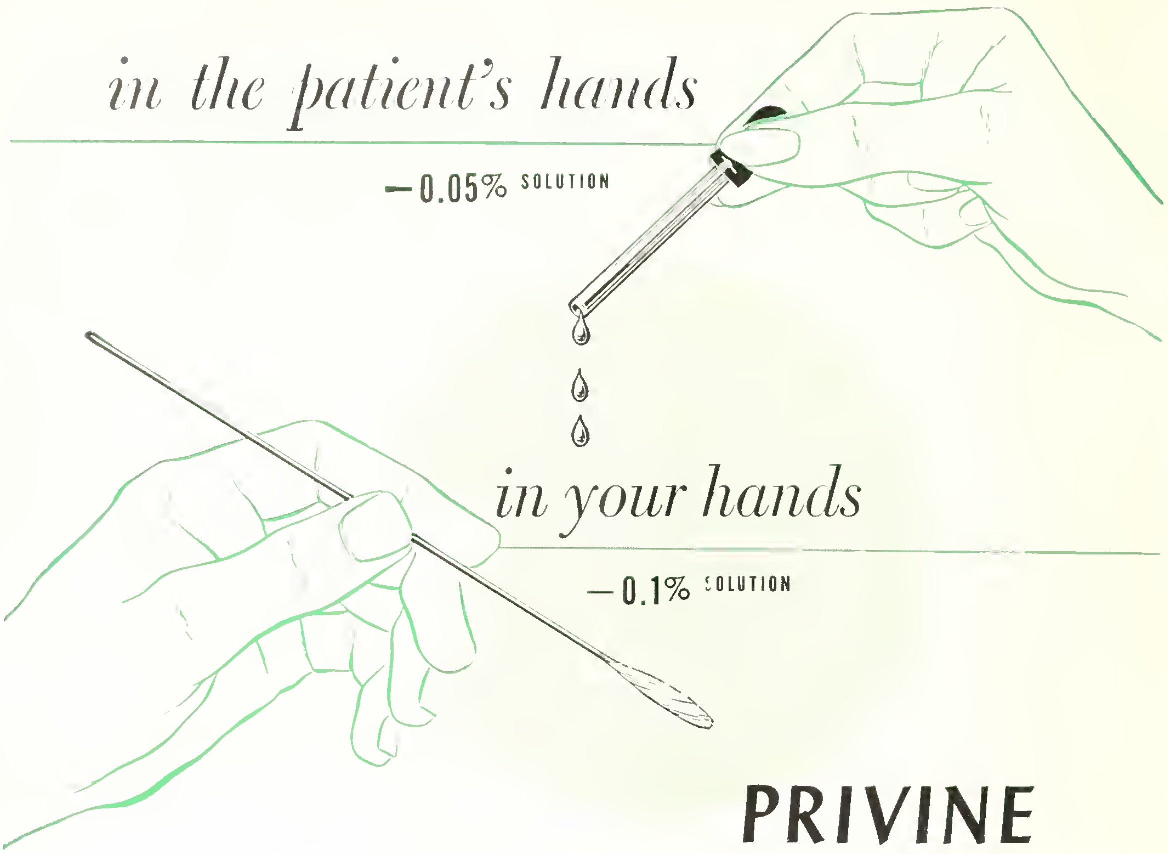

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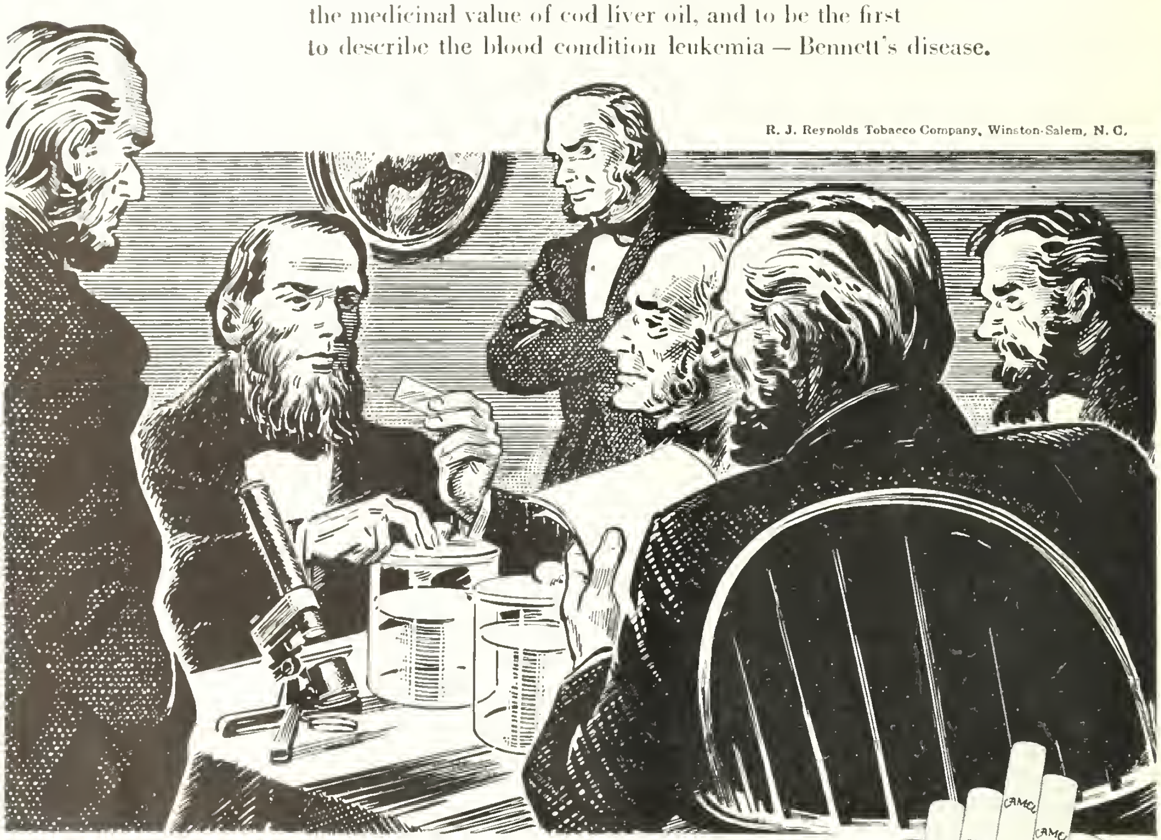

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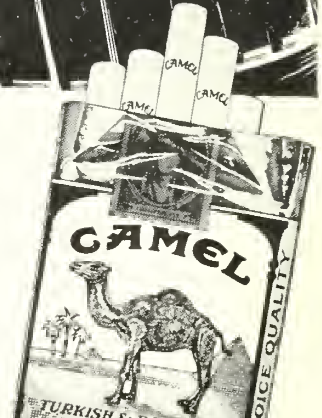

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The JOURNAL LANCET

Minneapolis, Minnesota
January, 1948

Vol. LXVIII, No. 1
New Series

The Physiological Characteristics of Uterine Cancer in Relation to Radiation Therapy

James F. Nolan, M.D.*
St. Louis, Missouri

Radiation therapy has assumed a position of definite importance in the management of cancer of the uterus, and it has reached this position in a comparatively short time. Increased knowledge of radiation physics and technical improvements in equipment have improved the usefulness of radiations. Biological experimentation and information gained from clinical experience have increased the effectiveness of radiation therapy. Still there are points of difference in the opinion of many clinicians as to the exact place of radiation in our therapeutic armamentarium.

The ultimate means of evaluating radiation therapy in uterine cancer is from examination of reported end-results. To be statistically significant such series must be well controlled and contain large numbers of patients. Since time is required to accumulate such data, plans of treatment to be studied must be made on the basis of theoretical concepts or experimental information. We must realize that radiation therapy has not been developed to a point of optimum effectiveness; therefore, it would be unwise to praise or condemn the treatment method finally on the information gained from its use to date. Still, it is advisable to re-evaluate this treatment method from the standpoint of the biological characteristics of uterine tumors. In this manner, we can better understand the treatment successes, the treatment failure, and the concomitant side-reactions. It is the purpose of this presentation to discuss the adaptability of radiation therapy to the growth characteristics of uterine cancer in order to emphasize the need for continued advances in technic of treatment. Although everyone would gladly discard this method of treatment for a more effective one, we must continue to use and improve our present methods until they are successfully replaced.

In such a discussion it is necessary to mention briefly the physical characteristics of radiations as employed in the treatment of uterine cancer. The usual sources of radiation for treatment are the X-ray apparatus and the natural radioactivity from radium or radon. The radiations from these sources, as used in therapy, are similar in that they are electromagnetic waves without charge or mass. Their various physical characteristics in regard to direction, quality and quantity can be controlled to a great extent. It is through this control that they become adapted to biological use. Although the physical factors involved in control are complicated, we will run the risk of oversimplification for the purpose of this discussion and consider "doses" delivered to the body merely as parcels of energy. However, we can not attribute magical qualities to these radiations as far as biological effect is concerned since they are definitely measurable entities from a physical standpoint. We must consider the biological changes noted after irradiation as due to the transference of energy (generated by the X-ray tube or by the disintegration of an atomic nucleus) to the matter exposed.

In general the biological reaction to these radiations may be considered simply as a response to physical injury. Radiations of this type, whether electromagnetic or particulate in character, lose energy as they pass through matter by disturbing the orbital electrons of the intervening atoms. The balanced atom systems are split into two parts which appear as negative secondary electrons and positive nuclei with unbalanced orbital rings. These parts are called ions and radiation measurements are made on the basis of the number of these ion-pairs formed.

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*From the Department of Obstetrics and Gynecology, Washington University School of Medicine, St. Louis, Missouri.

Presented at the annual meeting of the North Dakota State Medical Association, May 26, 1947, Fargo, North Dakota.

In tissue, such physical changes in the atomic orbits result in chemical disturbances in the complicated protein systems of the cellular nucleus or cytoplasm. These disturbances become manifest as cellular injury and may result in the interference of the metabolism of the cell so that it can not survive or reproduce itself. Cells in mitosis are more apt to succumb to such injury. For this reason tissues in high metabolic states such as the hematopoietic system, the gonads or malignant tumors are most susceptible. Since normal cells can withstand this and other physical changes better than abnormal cells, there is a tendency for normal cells to recover and cancer cells to perish. It is upon this differential recovery rate that the effectiveness of radiation therapy depends. Variation in the cellular reaction among different tissues is known as radio-sensitivity or radio-resistance.

What is later seen under the microscope is the cytologic and histologic response to the physical injury. There is first swelling of the cytoplasm and perhaps rupture of the cell membranes. The nuclei show karyolysis and karyorrhexis. The dead cells become masses of amorphous protein. There is a lymphocytic and plasma cell infiltration. There is a capillary proliferation and dilatation, and a perivascular fibroblastic response. From about two to six weeks there is organization of the injured area with swelling of the intima of blood vessels, occlusion of the lumina and fibrosis leading to avascularity.

Cervical Carcinoma: Any discussion of uterine cancer must necessarily be divided into two different biological categories; namely, carcinoma of cervix and carcinoma of corpus uteri. Since cervical carcinoma occurs more frequently (5:1) than carcinoma of uterine corpus, and because it is now treated almost exclusively by means of radiation, it may be considered of primary importance here. Carcinoma of the endometrium will be presented in contrast to cervical carcinoma from the same biological viewpoint.

The biological characteristics of cervical cancer can be grouped into three categories: the cytological, the histological, and the gross. Carcinoma of the cervix is most often a squamous cell lesion (95 per cent of the cases) and as far as histologic type is concerned, it may be considered "radio-sensitive." "Radio-sensitivity" is a difficult characteristic to measure absolutely and is usually used as a qualitative term. In comparison to tumors arising from osseous, fibrous or glandular structures, squamous cells are more effectively destroyed. On the other hand, squamous tumors are more resistant than those arising from lymphatic tissues. If the ionizing radiations are the same in all cases, there must be some difference among the cellular constituents of various types of tumors to bring about these differences. Microscopically the squamous tumors of the cervix may be graded into various types depending on their histologic characteristics. These variations in the cellular characteristics of the tumors is based on their resemblance of either embryonal, adult or intermediate types of epithelium. As far as radiation is concerned, the embryonal types which show tendencies toward rapid growth and, therefore, frequent mitosis and high metabolic rates are more susceptible to physical injury. So there is further variation among different carcinomata of the same type as far as "radio-sensitivity" is concerned.

From this discussion of radio-sensitivity and differential recovery rate the rationale of certain treatment technics becomes evident. The divided dose methods in which energy is delivered in rather small repeated increments has been found superior to massive dose technics. Furthermore, there are many therapists (especially the French School) who prefer protracted weak exposures to shorter, more intense treatments. With these adaptations not only can a larger total dose be delivered safely, but also superior results are claimed.

There are other biologic characteristics which may affect the success or failure of radiation therapy in carcinoma of the cervix. They may be more important in many instances than the histologic grading of the tumors as far as ultimate outcome is concerned. These characteristics have to do with the state of the normal tissue surrounding the carcinoma which is known as the tumor bed.

We may classify cervical tumors on the basis of gross growth characteristics into three types: the everting lesions, the cratered lesions, and the infiltrating types. Of these it is often noticed that the everting or cauliflower growths are most often successfully treated by radiation. In these cases, although there may be profuse discharge and infection, the tumor bed has usually walled the tumor off to some extent and the radiation effect is one of further delineation and interference with the vascular supply to the growing tumor. The cratered lesions probably represent advanced stages of the everting types and they, too, may be successfully controlled by radiation treatment unless intervening infection has disturbed the defensive mechanism of the tumor bed. The infiltrating lesions, on the other hand, are the hardest to treat successfully. Here by the characteristics of the tumor growth itself, the tissue defense is upset. As this type of tumor infiltrates along the tissue planes, there are repeated attempts on the part of the normal structures to wall it off. This results in extensive disorderly fibrosis and the subsequent radiation effect is nullified to a certain extent because the tumor has already adapted itself to this difficult environment.

The effect of overdosage in cervical carcinoma becomes very prominent when seen from the viewpoint of response to radiation by the tumor bed. We can not state at this time the exact amount of energy which must be delivered per gram of tumor tissue in order to kill all cancer cells and not injure normal ones. Even if we could do this, we could not expect all tumors or all tumor beds to react alike to the same amount of delivered energy. The only way to effectively avoid overdosage is to individualize patients under treatment and vary exposures to their responses. It is necessary to prevent overexposure because the resulting irreparable injury to the normal tissue surrounding the primary tumor may be more disastrous than the tumor itself. Perforations or cicatrical stenosis of the bowel; rectal and bladder fistulae; and extensive sloughs and infection may bring on unbearable discomfort or even death. Then, too, there may be individual tumor cells in the so-called parametrial triangle which survive this massive injury and later will be able to grow and reproduce. They are then more resistant to treatment because of the disruption of the natural barriers to spread. Overdosage to the tissue in the base of the broad ligament becomes manifest in excessive injury to normal tissue and in local recurrences of the tumor itself.

The biological characteristic of cervical cancers that perhaps has the greatest effect in the ultimate outcome of radiation therapy is the gross extent of the lesion. When the tumor does break out of its surrounding wall of fibrosis, it usually spreads by continuity and lymphatic extension into the vaginal fornices, along the bases of the parametria and then through lymphatic channels to the hypogastric, iliac, and aortic nodes. There is a tendency for the tumor growth to follow natural fascial planes so that the other vital organs of the pelvis are usually spared for some time; that is, the tumor tends to spread laterally more often than anteriorly or posteriorly. Extension by lymphatic spread down the vaginal walls in a retrograde fashion does occur frequently, but usually may be attributed to blocking of the normal channels by infection, radiation effect, or tumor growth itself.

It is customary to classify cervical tumors according to their gross extent for the purposes of description and for the evaluation of clinical results. Tumors of this type are usually divided into stages of involvement using the League of Nations classification. We can visualize these stages by considering certain blocks of tissue and their extent of involvement. If we consider the cervix itself in a small block, tumors confined to this area are classified as Stage I. If we consider a larger block taking in the parametria almost to the pelvic walls, the top of the uterus superiorly and the upper two thirds of the vagina inferiorly, we have the tissue involved in Stage II lesions. Stage III lesions involve a still larger block of tissue which includes the pelvic walls, the lower third of the vagina, and the superior strait of the pelvis. Stage IV lesions spread beyond the confines of the true pelvis, to the vulva and inguinal regions or into the mucosa of the bladder or rectum.

Although most cervical tumors may be classified according to this scheme, it is impossible to evaluate the exact extent of all lesions. In an estimated 50 per cent of all early cases (Stages I and II) the pelvic lymph nodes are involved before palpable extensions can be made out. So, although the probable effect of radiation therapy in most tumors can be ascertained to some degree by the gross grouping, unexpectedly poor results may occur if therapeutic measures are confined to the primary lesion itself.

In the main, the difficulties of radiation treatment increase with an increase in the mass of tissue involved. It is more difficult technically to cause the energy of the applied radiation to be distributed in a uniform manner in such cases; and the biological response to this release of energy may be influenced by disturbed circulation, concomitant infection and disrupted fascial planes usually seen in extensive lesions.

Further extensive growth into the wall of the bladder or rectum may eventually result in fistulae because of the lack of circulation to the growing tumor mass. Radiation treatment may bring this eventuality on more quickly by destroying the tumor cells comprising a plug in the wall of these viscera.

The usual therapeutic plan in all stages is to use as many different treatment portals as possible with X-rays and later apply the radium for more intensive treatment of the local lesion. In this manner the regression can start from the periphery inward, infection can be better controlled, and the subsequent radium implantation can be more effective. Four or more pelvic portals are used primarily and the beams directed toward the parametria rather than the primary lesion. This excludes the bladder and rectum from as much direct radiation as possible and yet contributes more to the control of lymphatic extensions than the other means of irradiation used. Some therapists add sciatic portals and many use transvaginal irradiation by X-rays in order to add to the parametrial dosage. Radium is applied also with this scheme of cross-fire in mind. Intra-uterine tandems plus intravaginal sources in the fornices and across the cervix are used so that each source contributes to the whole pattern of irradiation without over-irradiating the contiguous structures. Several clinicians prefer many weak parametrial needles as interstitial sources which add to a uniform field of radiation.

There are certain special instances of cervical carcinomata which may bear mention at this time. The squamous cell lesions developing in cervical stumps after hysterectomy are notably more difficult to treat. Not only is it more difficult technically to distribute radiation in such cases, but also these lesions are thought to spread more rapidly because of the disturbed vascular relationships and fibrosis consequent to the surgical removal of the uterine corpus. The adenocarcinomata which develop in the endocervix grow most often by continuity and usually have a well developed tumor bed. Although they are considered histologically more radioresistant than squamous lesions, they are amenable to treatment when it is adequately applied.

Endometrial Carcinoma: The clinical problems presented by the biological characteristics of endometrial cancer differ from those of cervical cancer. In the first place, cytologically the tumor cells arise from glandular structures rather than squamous tissue and are theoretically more radio-resistant. Histologically there are four classifications of endometrial carcinoma based on their tendencies to vary from the normal toward embryonal anaplastic growths. The more embryonal types are considered the most radio-sensitive, since they would be more susceptible to injury. However, the anaplastic types offer the poorest prognosis in the disease and the histologic classification has a greater influence on ultimate outcome here than in cervix cancer.

In general the typical endometrial tumor grows slowly by direct extension and since it remains inside the uterine wall, it is amenable to excision. There is lymphatic extension, however, which is usually from the uterine cornu along the superior margin of the broad ligament to the ovary and pelvic wall and there is oftentimes retrograde extension to the vaginal wall. These charateristics explain the recurrences that appear after a seemingly complete removal of the tumor by hysterectomy.

Infection plays a prominent part in endometrial carcinoma as it does in cervix cancer. The growing tumor itself or scarring from treatment may interfere with drainage from the endometrial cavity. This brings on pyometria which may open lines of spread through the barrier of natural resistance.

Because of the facts that the tumor is not visible and its exact extent is difficult to palpate accurately, any gross classification is liable to error. It is possible to obtain some correlation between prognosis and size of the uterus, as it has been found that if the uterus itself is large, the possibilities of survival are slight. This characteristic can be evaluated on examination and by measuring the length of the endometrial cavity. However, since fibroids occur concomitantly in about one third of the cases and may influence the size of the uterus, this classification is not too reliable. More accurate classification as to the gross extent of the lesions can be made after hysterectomy by grouping cases into stages according to the involvement of the uterine wall and beyond. These are not practical for clinical use, however, as many of these patients do not come to operation.

Another biological aspect of the endometrial cancer which differs from cervical cancer may be classified as constitutional. Patients who develop cancer of the corpus uteri are most often in the older age groups and frequently have severe constitutional disorders peculiar to age. Obesity, diabetes, hypertensive vascular disease frequently complicate the management of the carcinoma. A clinical classification of patients has been developed on this basis which is useful in evaluating treatment methods. There are three groups: the operable, the technically operable but clinically inoperable, and the inoperable patients. Although surgical treatment of the disease is probably the best single method in most hands, it can not be offered to many patients who have fundal cancer. Radiation methods have then been found to be of value for patients upon whom operation is inadvisable because of extension of the local lesion or constitutional inoperability. Radiation treatment is also thought to be of value as an adjunct to surgery in operable patients. The usual plans for radiation treatment in cancer of the endometrium are similar to those used in cancer of the cervix. Most often external X-rays are given first in order to clear up infection, to add to the parametrial dosage, and to cause primary regression of the tumor which facilitates the radium implantation. Because these patients are often obese, the external therapy must be carefully individualized in order to obtain adequate doses without causing injury to the skin and avascular fat pads. The technic of implantation of radium inside the uterine cavity is governed by the same physical principles as the technics in cervical cancer. The entire cavity must be utilized and as many sources of radiation as possible must be used so that a uniform field of radiation may be obtained. This concept is most important in endometrial cancer because we can not tell the position or extent of the lesion exactly. Various applicators, hysterostats, and packing technics have been found more successful than tandems. It is also advisable to irradiate the cervix and upper vagina because of the frequent retrograde extension of the tumor after occlusion of the usual channels. Surgery following radiation treatment is not contraindicated and hysterectomy is advisable in all possible patients. There are very few clinicians who depend on radiation alone in operable cases.

When we consider the end-results of our present methods of therapy it becomes obvious that there is need for improvement. In cancer of the cervix the usual absolute five year survival rate is in the order of 35 per cent, with about 50 per cent survival of the early cases and about 20 per cent survival of the late ones. In cancer of the endometrium the usual survival rate is in the order of 50 per cent, with 70 per cent survival of the early cases and 30 per cent survival of the late ones. Probably the most effective line of attack to improve these results will be through the development of new treatment apparatus and new technics of application. However, it is quite plausible that some control of the biological characteristics of these tumors may abet the effectiveness of our present and future treatment methods. On first examination there seems to be little that can be done in the way of control from a biologic standpoint. However, we can speculate on the possibility of affecting the various characteristics of these tumors.

As far as radio-sensitivity and recovery differential are concerned, it is theoretically possible to render some control. The temperature of the tumor cells could probably be raised by local induction of heat previous to each radiation treatment. This should increase the metabolism of the cells and make them susceptible to the ionizing radiations. It is also conceivable that the metabolism of the normal structures could be lowered by localized cooling, which would make them more resistant and increase the differential sensitivity. It may be possible to influence cellular resistance and affect the differential recovery rate by hormonal means during radiation treatment. These seemingly far-fetched and impractical ideas merely serve to emphasize our lack of complete understanding of the possibilities of the therapeutic measures upon which we now depend.

Another factor which may better be controlled in more instances is the amount of infection associated with these tumors. The bacterial flora is mixed, but the chief offender is usually the anærobic streptococcus. Oftentimes there is a vicious cycle of infection, slough, hemorrhage, and lowered local resistance. This yields to further spread of infection. Packing for hemorrhage impedes drainage, stimulates this cycle. Although sufonamides and antibiotics can be used systemically and locally to aid in the control of infection by inhibiting secondary invaders, they are not absolutely effective in controlling anærobic organisms. It is usually necessary to build general resistance by a high protein diet and transfusions. Packing should be avoided wherever possible; fibrin foam and thrombin are useful in checking mild bleeding. Extensive electrocoagulation may be done, but this procedure often leads to necrosis and slough and perhaps further bleeding. This phase of local care of cervical and endometrial tumors needs further examination and improvement.

There is one phase of biological control that may seem obvious, but is certainly effective. The difference between the end-results in early and late cases is so great that control of the gross extent of the lesion by early diagnosis and treatment is most important. Attempts to educate the laity and the profession to "cancer-consciousness" should cause more patients to present themselves for treatment when the disease is in a curable stage.

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MEDICAL STRIDES IN 1946

Watson Davis, the director of Science Service in Washington, has picked the following facts as the outstanding advances in medicine for the year 1946:

1. Distribution of radioactive isotope varieties of common chemical elements, made in chain-reacting atomic pile, for research and medical use.
2. Synthesis of penicillin and of Vitamin A.
3. Revelation of biological warfare developments, including vaccine against rinderpest, and isolation of botulinus toxin.
4. Photography of solar spectrum above ozone layer by flight of V-2 rocket into upper atmosphere.
5. First flight of supersonic plane XS-1 and other rocket and jet propulsion advances not fully revealed.
6. Production of antimalarial chloroquin, declared better than atabrine and quinine, and pentiquine, believed positive cure for vivax malaria.
7. Prediction and observation of Giacobini-Zinner meteor shower, and artificial meteor shower from V-2 rocket.
8. High voltage machines, including first operation of frequency modulated supercyclotron, beginning of linear accelerator and synchrotron, and betatron improvements.
9. First births of animals from foster mothers into which were transplanted ovaries from other animals.
10. Organization of United States Atomic Energy Commission, UNESCO and World Health Organization.—*Hospital Topics,* November, 1947.

Clinical Use of Antibiotics with Special Reference to Penicillin and Streptomycin

Wallace E. Herrell, M.D.*
Rochester, Minnesota

In the past ten years in the field of chemotherapy we have witnessed the advent of sulfonamides, which was followed by the widespread renewal of interest in antibacterial agents of microbial origin. The term "antibiotic agent" has been applied to these substances, which include tyrothricin (originally called "gramicidin"), then penicillin and more recently streptomycin. There are many other antibiotic substances which are known but these three are by far the most important at the present time. It might be well to consider briefly the source of these antibiotic agents. In general, they have been derived from three types of sources. One source is bacteria; tyrothricin is an example of an antibiotic of bacterial origin. Another source of antibiotics is, of course, molds and fungi; penicillin, derived from the mold, Penicillium notatum, is obviously the most important antibiotic from this source. The third general source is the actinomycetes; streptomycin is by far the most important antibiotic from this general source. In this discussion I shall deal separately with the three antibiotic agents I have mentioned.

Tyrothricin

Tyrothricin still proves useful as a local agent in combating certain infections owing to organisms sensitive to its action. It has proved effective in the treatment of various infected ulcers and wounds. It is highly effective also in the treatment of bovine mastitis. Because of its hemolytic property it cannot be administered under conditions in which it will come into direct contact with the blood stream. Aside from this hemolytic property, however, tyrothricin is notable for its lack of toxicity to tissue. It may be applied locally in the form of an aqueous suspension or in the form of a cream. The usual concentration which is recommended is 500 to 1,000 micrograms per cubic centimeter.

Penicillin

Time does not permit a detailed discussion of all of the possible clinical uses of penicillin but certainly I believe that experience justifies the statement that it is the one antibacterial agent at our disposal which seems to possess the widest range of activity. It is highly effective against most gram-positive pathogenic cocci and at the same time is highly effective against certain gram-negative cocci such as Neisseria intracellularis and Neisseria gonorrhœae. In addition to this, it is fortunate that penicillin appears to be so effective against other pathogenic microbes, such as Actinomyces bovis and the spirochetes.

I think it would be well to clarify my opinion about the proper dosage of penicillin. There has been a tendency in all quarters to increase the dose of penicillin. This apparently has developed on the assumption that if a little is good, more is better. It is my opinion that 20,000 to 30,000 units of penicillin every three hours by the intramuscular route is an adequate amount with which to treat most infections which are owing to organisms that are sensitive to its action. There are a few exceptions to this general rule. In my opinion one should use 1,000,000 units per day in the treatment of bacteriemia, in the treatment of subacute bacterial endocarditis and in the treatment of actinomycosis. In the treatment of bacteriemia and subacute bacterial endocarditis, I still feel that at least for the first few days it is best to give the penicillin by the intravenous drip method. One point seems worth emphasizing. It is not how much penicillin one is using but how potent the material is that matters. Obviously, if one is using a penicillin, the content of which is high in the inactive fraction, one will have to use larger doses than if one is using a more potent preparation.

At this point a word might be said concerning the oral use of penicillin. I recognize that the oral use of penicillin is justified in the treatment of infections which are not life-endangering. For this purpose it is recommended that 50,000 to 100,000 units be administered at least eight times per day. In overwhelming sepsis or potentially severe infections the oral use of penicillin should be discouraged.

Rather than discuss specific diseases, I would like to discuss a few aspects of the problem of penicillin therapy in infections involving certain systems of the body.

When one is dealing with an infection of the blood stream (bacteriemia or bacteriemia associated with subacute bacterial endocarditis) it is essential that large doses of penicillin be administered. By large doses I mean at least 1,000,000 units per day. As I have mentioned previously, my colleagues and I feel that it is best to treat these patients by means of the intravenous drip method. In the treatment of bacteriemia, the administration of the drug should be continued until the patient is symptom-free and afebrile and until two or three negative blood cultures have been obtained. In the treatment of subacute bacterial endocarditis, we feel that these patients should be treated for at least four to six weeks. Unless one is prepared to treat them over a long period, the results are not likely to be good. It is also important that one test the sensitivity of the organism and adjust the dosage accordingly. In treating subacute bacterial endocarditis owing to rather resistant organisms, it may be necessary to use 4,000,000 to 5,000,000

Read at the meeting of the North Dakota State Medical Association, Fargo, North Dakota, May 26, 1947.

*Division of Medicine, Mayo Clinic.

units of penicillin per day. Such instances are exceptions, however, rather than the rule in my experience.

Most infections involving the respiratory apparatus, including diseases of the paranasal sinuses and pneumonia, will respond to 20,000 to 30,000 units of penicillin given every three hours by the intramuscular route. I think one should remember, however, that sulfonamides (particularly sulfadiazine and sulfamerazine) are still exceedingly effective agents in the treatment of pneumococcal and streptococcal pneumonias. In the rare instance of a staphylococcal pneumonia, penicillin is certainly the drug of choice.

Penicillin has proved exceedingly effective in the treatment of certain infections involving the central nervous system, including meningitis, wounds of the brain and brain abscesses. Concerning the treatment of meningitis, it is my opinion that penicillin should be administered by the intramuscular route and this should be supplemented by 10,000 units of penicillin dissolved in 5 or 10 cc. of physiologic saline solution by the intrathecal route every twenty-four or forty-eight hours for at least the first few days of the disease. It is my opinion that penicillin is as effective as sulfonamide therapy, if not more so, in the treatment of meningococcal meningitis. In the treatment of pneumococcal meningitis the problem is a little different. One should not rely on penicillin or sulfonamides alone in the treatment of this infection. I would recommend the use of both. Even when both agents are combined, there will be some failures in the treatment of this infection. In the treatment of infected wounds and brain abscesses, penicillin used alone is of value but its greatest value is when it is used in combination with adequate surgical treatment.

Perhaps the most important infection which concerns the skeletal system is osteomyelitis. Experience has taught us several things. There is no doubt but what the usual therapeutic use of penicillin has brought about many satisfactory results and cures in the treatment of acute osteomyelitis with or without bacteriemia. In the treatment of chronic osteomyelitis the problem is again a little different. The greatest use of penicillin in the treatment of chronic osteomyelitis is in combination with adequate surgical treatment. Best results will be obtained in chronic osteomyelitis when patients are treated with penicillin for several days to a week before operation and administration of penicillin is continued for two or three weeks in the postoperative period. At the time of operation thorough removal of devitalized tissue and eradication of foci are essential features of adequate treatment. In general, it would appear that osteomyelitis of the flat bones responds better than osteomyelitis of the long bones.

There are certain common infections which involve the skin and subcutaneous tissue in which penicillin has clearly established its value. All are aware of the exceedingly satisfactory results which have been obtained in the treatment of cellulitis, furunculosis and carbuncles. In general, my colleagues and I have relied on the intramuscular method of treatment in these cases. Rarely have we found it necessary to inject penicillin locally into furuncles and carbuncles.

Most investigators will agree that great success has been encountered in the treatment of genito-urinary infections caused by susceptible organisms. Outstanding results have occurred in the treatment of gonorrhea, both in males and in females. I have not seen any of the so-called penicillin failures in gonorrheal infections. Furthermore, we have not encountered any resistant strains of Neisseria gonorrhœae. To be sure, this may occur but certainly it has not been a problem to date. In my opinion, failures can be explained in one of two ways: either the penicillin used had lost potency or was not potent or the patient had become reinfected. I will not discuss here the use of penicillin in the treatment of syphilis other than to say that penicillin has definitely established itself as a part of syphilotherapy. A detailed discussion of this aspect of the problem is presented by my colleague, Dr. Paul O'Leary.

I would like to mention the use of penicillin in a few specific diseases. In this part of the country actinomycosis is fairly common. It is my opinion that penicillin is the most effective agent yet available for the treatment of this disease. I have mentioned earlier in this paper that we feel that these patients should receive 1,000,000 units per day and our experience leads us to the conclusion that they should be treated for about four to six weeks. Most cases of actinomycosis will not require extensive surgical treatment if adequate penicillin therapy is administered.

All agree that penicillin inhibits the growth of the organisms which cause gas gangrene, diphtheria and tetanus. All agree that penicillin probably should be used in the treatment of all three of the infections just mentioned. There is one point, however, which I cannot overemphasize; namely, penicillin is not an antitoxin. It may inhibit the growth of the organisms but it will not neutralize toxins. It is absolutely essential, therefore, in the treatment of gas gangrene, diphtheria and tetanus that one use, in addition to penicillin, the antitoxins which are available for these diseases. If this maxim is forgotten, unhappy results must be anticipated.

I would like to discuss briefly the question of penicillin resistance on the part of organisms. There are, of course, many organisms which are naturally resistant to penicillin but I do not subscribe to certain current opinions that penicillin is losing its effectiveness. Given an organism which is sensitive, the problem of the development of resistance on the part of the organism while the patient is under treatment is not yet a major one. Too frequently the term "resistance" is used to explain a poor result when the actual problem is simply a collection of pus or an abscess which has not been adequately drained. Penicillin is no substitute for good medical and surgical judgment.

Undoubtedly the most important toxic reactions to penicillin are the cutaneous toxic manifestations such as urticaria or irritative dermatitis. I would say that the incidence of these reactions is somewhere between 5 and 10 per cent. Most urticarial reactions will subside following the administration of one of the antihistamine drugs such as benadryl (beta-dimethylaminoethyl benzhydryl ether hydrochloride) or pyribenzamine (N^1-pyridyl-N^1-benzyl-N-dimethylethylene diamine hydrochloride). The usual dose of benadryl or pyribenzamine is 50 mg. three times per day. The pleasing thing about penicillin is its lack of toxicity. Most clinicians are aware that the indiscriminate use of sulfonamides may be followed by certain serious toxic reactions involving the blood stream. Agranulocytosis is an example of such a reaction. Penicillin therapy has not resulted in any such calamity. In fact, penicillin is the drug of choice today in the treatment of agranulocytosis. Its use in the treatment of agranulocytosis has, indeed, been lifesaving.

Before leaving the subject of penicillin, I would like to mention the use of penicillin as a prophylactic drug. There is perhaps a place for the use of penicillin in the prevention of certain infections or complications which may follow operative procedures in infected or potentially infected regions. I think one might put it this way: Penicillin is excellent as a preventive drug as long as one knows what one is trying to prevent. Experience to date, however, does not justify the conclusion that penicillin should be used in any and every case to prevent infections which are not likely to occur. In this connection I would like to mention the recent report by Burke[1] on the oral use of penicillin in the prophylaxis of recurrent rheumatic fever. If subsequent experience confirms this report, oral administration of penicillin may well supplant sulfonamide prophylaxis in rheumatic fever if for no other reason than the fact that penicillin is considerably less toxic than the sulfonamide compounds.

STREPTOMYCIN

Streptomycin was first described by Schatz, Bugie and Waksman[2] in 1944. As I have already mentioned, this is an example of an antibiotic which is derived from an actinomycete. Because of previous experience with penicillin, studies on streptomycin have progressed rather rapidly. It was soon learned that streptomycin behaves not unlike penicillin when it is injected into the body. In other words, it diffuses rather readily throughout most body tissues and is excreted in certain body fluids such as urine, bile, milk and so forth. It differs from penicillin in the fact that even large amounts when given by mouth do not penetrate into the blood stream. In other words, it is not absorbed from the intestinal tract but remains there. This makes an additional weapon in the preparation of patients for operations on the bowel. This is so because streptomycin markedly inhibits the growth of the coliform organisms present in the fecal stream.

In general, streptomycin is primarily effective against certain important gram-negative microbes, whereas penicillin, for the most part, is effective against gram-positive pathogens. Streptomycin also inhibits the growth of certain gram-positive organisms.

In general, the average daily dose of streptomycin is 2 gm. per twenty-four hours. A convenient method of administering this amount of material is to dissolve it in 16 cc. of distilled water and administer 2 cc. every three hours by the intramuscular route. On occasion as much as 3 or 4 gm. per day may be given for short periods but in the treatment of most acute infections it would appear that 2 gm. is the average daily dose. Not unlike penicillin, streptomycin may be administered locally, intraspinally, intrathecally and by nebulization. There is no contraindication to the simultaneous administration of streptomycin with penicillin or sulfonamides.

Clinical results. Some of the most striking clinical results obtained to date with streptomycin have been those which followed its use in the treatment of tularemia. In this disease streptomycin has clearly established its value. In the past, patients who had tularemia were frequently ill for as long as twelve to sixteen weeks and many failed to survive. To date no failures have been reported in cases in which tularemia has been treated with streptomycin. The average dose of streptomycin used has been 2 gm. per day for seven to ten days. The clinical improvement is dramatic and recovery has been uneventful in all forms of tularemia treated.

Bacteriemia and infections of the urinary tract due to Escherichia coli also have responded satisfactorily to streptomycin. There have been some failures in this group due to the fact that the organism was resistant or became resistant to streptomycin.

Rather satisfactory results have been obtained in cases of bacteriemia and infections of the urinary tract owing to Proteus ammoniae and Aerobacter aerogenes. Infections of the urinary tract should be treated intensively for five to seven days. Treatment should not be begun until foreign bodies and obstruction have been removed from the urinary tract. The presence of foreign bodies or obstruction favors the development of resistance to streptomycin.

The organism Hemophilus influenzae is sensitive to the action of streptomycin. It is not surprising, therefore, that satisfactory results have been obtained in the treatment of influenzal meningitis with streptomycin. It is generally agreed, however, that in cases of severe influenzal meningitis treatment with streptomycin should be combined with sulfonamide therapy. Likewise, Hemophilus pertussis is sensitive to the action of streptomycin but clinical results to date have not progressed sufficiently so that any definite statements can be made about the value of streptomycin in whooping cough. Clinical trials are under way.

Streptomycin has been found of value in the treatment of Friedländer pneumonia and it also appears helpful in the treatment of ozena. Unfortunately, recurrence and the development of resistance on the part of the organism are rather frequent in this group of infections.

In spite of the fact that the organisms belonging to the typhoid or paratyphoid group are reasonably sensitive to streptomycin in the test tube, the clinical results of its use to date in the treatment of typhoid fever have not been encouraging.

Although streptomycin for the most part is effective against gram-negative organisms, a few strains of Staphylococcus aureus, a gram-positive organism, also are sensitive to streptomycin. My colleagues and I have had occasion to see recoveries from staphylococcal bacteriemia when the organisms were resistant to penicillin but yielded to streptomycin.

Pasteurella pestis, the organism which causes plague, also is sensitive to the action of streptomycin. Plague, of course, is not an important disease in North Dakota; however, it is encountered occasionally in certain parts of this country. From the studies on animals reported to date it is reasonable to assume that streptomycin should prove of value in the treatment of plague.

Early reports of an experimental nature suggested that streptomycin might prove of value in the treatment of undulant fever. The organism responsible for undulant fever is moderately sensitive to this antibiotic. Unfortunately, streptomycin was hailed as a cure for this rather common infection and this is not the case. Experience to date would lead me to conclude that streptomycin may be of some value in the treatment of undulant fever in the early acute stage, with or without positive blood cultures. I do not believe, however, that this beneficial effect is much greater than that which can be obtained by using three ten-day courses of treatment with one of the sulfonamides, such as sulfadiazine. In the treatment of so-called chronic undulant fever or brucellosis of months' or years' standing, I am convinced that streptomycin is of little or no value.

I am not qualified to speak with authority on the chemotherapy of tuberculosis. I will try to summarize the impressions I have gained from observing the studies of my colleagues as well as those carried out by other investigators. The evidence seemed clear from animal (guinea pig) studies reported by Feldman and Hinshaw[3] that streptomycin exerted a definite suppressive effect on the course of this infection. This work naturally led to a widespread interest in its possible value in treatment of clinical tuberculosis. The effect of this substance in certain cases of pulmonary and extrapulmonary tuberculosis, including cases of cutaneous tuberculosis, renal tuberculosis and tuberculous meningitis, has been investigated. I believe that the investigators are of the opinion that streptomycin exerts a suppressive effect but has not been hailed as a cure. As the matter stands, it is an important addition to standard forms of treatment. Unjustified publicity can lead to only one result. Patients will clamor for this new form of treatment and if its value is overstressed, patients may refuse conventional forms of treatment including care in a sanatorium. It is the responsibility of the medical profession to see that this does not occur.

I should mention some of the toxic properties of streptomycin. In general, streptomycin is a fairly safe antibacterial agent. If the type of streptomycin available at the present time is used, it is unlikely that any renal damage or any toxic reactions in the hematopoietic system will occur. In this respect streptomycin is very much like penicillin. Perhaps the two most common toxic reactions encountered following streptomycin therapy are the cutaneous toxic reactions and the newer toxic effect on the eighth nerve. The cutaneous reactions are not unlike those seen following the use of penicillin. They usually respond to the same treatment as has been mentioned earlier in this paper. Unlike penicillin, streptomycin appears to possess a neurotoxic effect on the eighth nerve. This reaction imposes a real problem but is not insurmountable. As a rule it is not encountered when streptomycin is used for a short period, as for acute infections, although on occasion I have seen it develop soon after treatment is started. It is encountered rather frequently, however, when streptomyicn is used for long periods, as is necessary in the treatment of tuberculosis. The reaction may take the form of vertigo, which results from damage to the vestibular branch, or of a nerve deafness, which results from damage to the auditory branch of the eighth nerve. Both reactions may occur in the same patient.

Resistance to streptomycin will develop at times in certain organisms; in fact, in some organisms it will develop with incredible rapidity. In the treatment of acute infections, therefore, intensive treatment for a short period is exceedingly important. Every effort should be made to reduce factors which favor resistance. Walled-off abscesses, when present, should be drained. Foreign bodies should be removed. Stasis and obstruction such as occur in infections of the urinary tract should be dealt with before treatment with streptomycin is begun. Finally, the pathogenic organisms should be tested for sensitivity before and during treatment. This testing necessitates frequent recourse to laboratory procedures which only the bacteriologist can furnish.

Comment

The development of antibiotic therapy has been one of the great contributions to medical science. With this development come new problems but there has been a concurrent widespread stimulus to the investigation of other antibacterial agents. I have tried to summarize briefly some of the experience that my colleagues and I have had with these substances. I am sure everyone joins me in the hope that in time we may have effective agents against all of the diseases of microbial origin.

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Visual Examination for School Children

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For a number of years I have felt that the usual visual acuity test at twenty feet by a Snellen chart was generally inadequate as a means of judging the eye fitness of school or college students. It is evident that the Snellen test at twenty feet serves to select only those having myopic errors, gross degrees of astigmatism, or actual visual loss. The great publicity given by Army and Navy to such fractions as 20/20, 18/20, etc., has greatly exaggerated the significance of the test to the lay mind. Such a record as 20/20 is almost universally accepted by veterans as a guarantee of a normal eye. They become rather apprehensive when, upon returning to school, symptoms of eye fatigue develop. They frequently report to the Health Service to see if they have lost their 20/20 rating. The military services were concerned only with how well a person could see. With a few exceptions, the element of eye fatigue was unimportant to them.

In Health Service work, however, we are concerned mostly with eye performance, no matter what the limitations of visual acuity may be. Many of our good students, and faculty members also, are myopic. Usually, they use their eyes many hours a day without discomfort. Such a condition is easily found by the usual tests, and the need for correction is manifest.

A large proportion of the students, however, is in the class having 20/20 vision or nearly so. Many have normally functioning eyes, but a substantial remainder are riding under false colors, since, in order to maintain 20/20 vision for distance and a satisfactory reading adjustment, they are forced to make abnormal monocular and binocular muscle adjustments.

In Student Health services, this group has been glibly passed by, in the hope that symptoms of their difficulty will appear and be recognized before serious damage has been done to either the eye itself or to the academic accomplishment of the student. These students frequently appear at the Health Service during the preparation period for examinations, and request headache pills or other medication. They do not, in general complain of loss of visual acuity, but rather, they are unable to use their eyes for intensive study required at this time. Some lose interest in school work, turn to athletics, or stop school entirely. A number of factors may be implicated, but by far, most of these cases are associated with one condition; i. e., fatigue of the ciliary muscle.

Two types of refractive errors are usually associated with the overwork of the ciliary muscle; namely, hyperopia, and astigmatism of low degree. Astigmatism is the condition when the cornea and/or the lens of the eye is not spherical in shape, but distorted to such a degree that a perfect retinal image cannot be produced under any circumstances. If the distortion, however, is not great, the eye attempts constant readjustment of the ciliary muscle, attempting to compensate for this deficiency by alternately focusing linear objects in opposite meridia, ever seeking for a clear image which is not obtainable. This overwork of the ciliary muscle results in early fatigue and symptoms of headache and blurred vision while reading. It is possible to detect this condition without too great effort by the use of a "crossed cylinder." This test could be made a part of a routine entrance procedure.

The second condition responsible for ciliary fatigue; namely, hyperopia, can also be readily found at the time of taking the Snellen record at twenty feet. This may be accomplished by placing a pair of glasses fitted with plus 0.75 spherical lenses before the eyes of all students having 20/20 vision. Their ability to read through such glasses is proof that the eye has less than the amount of basic refracting power considered normal.

For a better understanding of visual testing by students, teachers and physicians not familiar with ophthalmology, a consideration of the following explanation of errors of refraction may be helpful. Generally, this subject has been explained on an anatomical rather than a physiological basis. The normal, myopic or hyperopic eye is usually described in terms of the relative size of the eyeball, or the theoretical location of the point of focus, as on, in front of, or behind the retina.

It should be more understandable, however, to define these conditions in terms of varying focal power of the eye. It must be constantly born in mind, however, that all definitions assume that the focal power of the eye is at its minimum degree, when the definition is applied, or in other words, the ciliary muscles are fully relaxed at this time. It is possible through the act of accommodation, only to increase this power; never to reduce it below this minimum value.

The normal eye, when so relaxed, has just a sufficient power of refraction to focus the parallel rays of light, from objects situated twenty feet or greater from the eye, on the retina, without the use of accommodation. The myopic eye is inherently endowed with more than this amount. This excess can not be reduced except by the use of concave lenses.

The hyperopic eye, however, has basically less than the requisite power to focus images accurately upon the retina, and must at all times exert some accommodation in order to see clearly. This is true for all distances, but the effort is much greater at the reading distance than for distant vision. As long as accommodation can be exerted without fatigue, however, the hyperope has clear vision at any reasonable distance.

Conversely stated, an eye capable of clear distance

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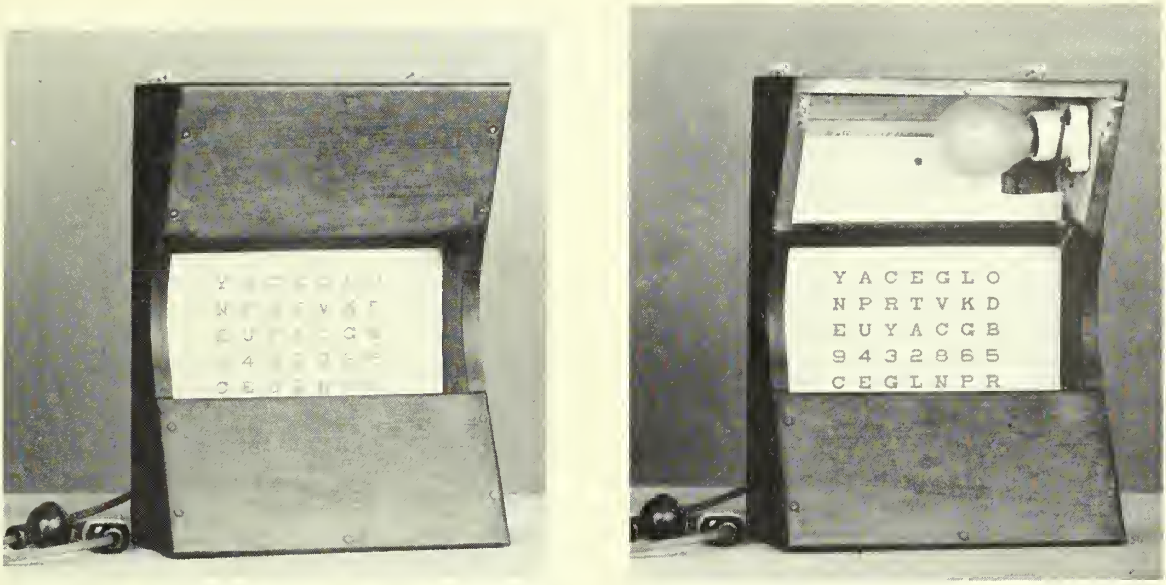

Fig. 1. The letter chart was devised by Dr. Emory W. Sink, Student Health Service, University of Michigan. The dimensions of the chart are 8½"x 12". The illuminator box has outside dimensions—9½"x 13" with a depth of 4½" at each end. It is constructed of wood—½ inch thick. The lights are placed, one at each opposite corner and should be of low candle power. Two pieces of wood ¼"x ¾" extend across the box and should be so adjusted as to eliminate glare on the chart and adjust the degree of illumination to the ten foot-candles recommended by the Eye Committee of the American Student Health Association.

vision through plus spherical lenses must have basically less than normal refracting power. This is the foundation for the "fogging test," usually used to detect manifest hyperopia.

Dr. Bradshaw suggested several years ago that we should devise a simple refraction technique to be utilized by teachers, nurses, or school physicians in an effort to screen out that group of students who, while having a nearly 20/20 Snellen record, are apt to develop fatigue symptoms from use of their eyes in the school program. It is with this in mind that I am making three suggestions for the betterment of eye testing in school work.

1. Replace the usual Snellen chart by a small chart having five rows of letters, all of the one size, normally visible at twenty feet. Such a chart can easily be illuminated by a single lamp with a reflector, or better, placed in a small cabinet made of thin wood and illuminated by two small bulbs (25 to 30 watts). This cabinet weighs only a pound or two and can easily be made in any school shop for a small cost. (See Fig. 1.)

2. Visual acuity should be recorded as the greatest distance in feet from the chart where clear vision is possible, and where twenty feet is normal. This chart and method has several advantages over the usual Snellen technique. (a) The cabinet is light, inexpensive, and can be easily carried to the place where mass physical examinations are being done. (b) It is impossible for students to memorize the five rows of letters when they approach beyond twenty feet from the chart. (c) The fact that some students read the chart readily at twenty feet and others must approach to even one or two feet makes a strong mental impression on the deficient student. After using this technique for several years, I am convinced that the distance from the chart, rather than the size letters seen, is more impressive to the lay mind. (d) When visual defects are reported to the teacher as the greatest distance for effective vision, it has a direct application in the seating arrangement of students in the class room, relative to the distance from the blackboard. (e) The distance from the chart is also a rough measure of the degree of myopia present, if such be the cause of the poor vision.

3. Students who have normal vision at twenty feet should be further tested by placing before their eyes a pair of frames fitted with plus 0.75 spheres. (Plus 1.00 to plus 1.25 spheres may be used for young children who are apt to be hyperopic normally.) Clear vision through these glasses indicates hyperopia and suggests that the student should be watched for evidences of eye fatigue.

An additional test might also be included under some circumstances to detect the presence of astigmatism of low degree. This is accomplished by rotating a crossed cylinder (—025 = +025) before each eye separately, while standing at the greatest distance from the chart where clear vision is had. Decided differences in visual acuity in any two positions of the crossed cylinder is indicative of astigmatism. Decided clearing of vision with the cylinder in any position indicates astigmatism of a sufficient degree to usually call for an ophthalmological examination.

Lipomas of Large and Small Intestine

A Clinical and Pathological Study of Twelve Cases Which Produced Symptoms Necessitating Surgical Intervention

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INTRODUCTION

THERE is probably no benign tumor of the intestines which so closely resembles a malignant neoplasm of the bowel, in its clinical features, as does a submucous lipoma which produces partial or complete intestinal obstruction. It is for this reason that the author felt that a careful clinical and pathological study might lend additional aid in an accurate preoperative diagnosis, thereby permitting less extensive operative procedures if these benign tumors are so recognized before or at the time of operation.

PRESENTATION OF DATA AND REVIEW OF THE LITERATURE

The lipoma is the most common benign tumor of the intestinal tract next to the adenomatous polyp. The third most common benign tumor is the fibroma. The submucous lipomas are more frequent than the subserous and they are more apt to produce symptoms by their growth into the lumen of the bowel. These tumors are found most frequently in the large intestines. This was confirmed by Comfort. Of his 181 cases, 92 were found in the large intestine while only 65 were found in the small intestines. In Comfort's series of 3,924 consecutive autopsies an incidence of 0.6 per cent was found.

In regard to the number of lipomas which produced symptoms, Comfort found in 181 cases that symptoms were caused by 34 lipomas of the small intestines and 74 lipomas of the large intestine. In Stetten's series of 71 cases he found definite symptoms in 56 cases. Pemberton and McCormack found 113 cases of submucous lipomas of the colon and rectum and in 94 of these cases the tumor produced symptoms. From this review of the literature, we could say that lipomas are rather common in the small and large intestines, either as an incidental finding or associated with symptoms.

Stetten in his series found that 50 per cent of submucous lipomas were found between the age of forty and sixty in individuals with a tendency toward adiposity. Comfort also found the highest incidence in this age group, namely between fifty and fifty-nine years of age. The cases of lipoma seem to be equally distributed between the sexes from a review of the literature. Stetten states that there appears to be no particular predominence in either one of the sexes. Comfort found also that the cases were about equally divided between the sexes. He found 81 males and 72 females with lipomas in which sex was mentioned.

Intussusception is a common and important complication of submucous lipomas of the intestinal tract and it is noted that the symptoms are much more acute when the ileum is affected. In 50 per cent of the cases reported by Dewis, intussusception had developed. Comfort, in a series of 91 cases of intestinal lipomata, found intussusception as a complication in 59. Intussusception occurred in 80 cases as described by Poston, 34 of which were enteric in variety. He also makes the statement that enteric intussusception due to this benign new growth is very rare. However, in reviews of the literature, intussusception has been a very common complication and is seen in at least 50 per cent of the submucous lipomas which produce any symptoms whatsoever. In Stetten's series, intussusception was found in 43 per cent of his cases. He further states that in 60 per cent of intestinal cases, in which symptoms were present, an invagination of the bowel existed and in every case the tumor was situated at the apex of the invagination.

It is interesting to note that out of 63 lipomata as reported by Ratcliff, 12 passed spontaneously and in one case a lipoma was passed with 120 cm. of intussuscepted bowel with complete recovery of the patient. Bland-Sutton noticed dimpling of the serosa as a result of traction and he believes nearly all lipomata are subserous in origin. Stetten, however, disagrees with this and he states that the dimpling is caused by commencing invagination produced by the growth.

The treatment of intussusception due to a tumor is along the usual surgical lines but careful search for a tumor, especially in the proximal gut, should be made in all cases of intussusception occurring after infancy. Oughterson and Cheever write that every tumor of the intestinal tract, especially if it projects into the intestinal lumen, should be removed no matter how benign the character, unless there is some definite contraindication, since it always carries with it the threat of intussusception.

Lipomas of the intestinal tract are found to be very difficult to differentiate from carcinomas involving the intestines. Ratcliff found that the average length of time of symptoms was longer than in the case of carcinoma. He found the average length of time to be four years in his series of 28 cases of benign tumors of all types. He further states that every case of intestinal lipomata which comes for treatment presents abdominal pain as the major symptom and this pain, which ususally comes on in bouts, is probably due to spasm of the muscle coats of the intestines.

In the cases presented by Pemberton and McCormack the symptoms were those of intestinal obstruction and the average duration of symptoms was 41.5 months. They further state, however, that the most common diagnosis in these conditions is carcinoma or appendicitis.

McCloskey, in his paper, speaks of a silent period when the tumor is the size of a hazel nut and constipation is the predominant symptom, but at this time constipation is not recognized as a symptom of the benign tumor. Then follows the manifest period when 50 per cent of the cases have gastro-intestinal symptoms before chronic ileus sets in. Pain is the usual early complaint, it may be diffuse or localized, followed by nausea, anorexia, constipation, diarrhea, and ileus.

Dull reports a case of submucous lipoma of the cecum in which the symptoms resembled appendicitis. However, the patient had lower abdominal distress of five years' duration with rather severe chronic constipation for the past ten months, which should rule out an acute condition like appendicitis.

DeLuca and Henstell report a case of submucous lipoma of the cecum causing obstruction. The preoperative and postoperative diagnosis in this case was carcinoma of the cecum and the ascending colon. At the operation, the cecum, ascending colon and part of the transverse colon were resected and an ileocolostomy was done. These authors state that to confuse this condition with appendicitis is not serious but to confuse it with a malignant growth often leads to a large amount of unnecessary surgery and the subjection of the patient to an unwarranted risk. In this case there was rather severe anemia, the hemoglobin being 35 per cent and the R.B.C. 1,850,000. They feel that the cause of the anemia lies in the functional disturbance in this region, in that many clinicians recognize that lesions of the ileocecal region have a marked tendency to produce secondary anemia.

In a case reported by Panzer and Porretta there was loss of weight, asthenia, anorexia, and obstruction in a patient age fifty-five. In view of these findings and the fact that carcinoma most often is the cause of obstruction, the diagnosis was carcinoma of the colon and a resection of the transverse colon was performed. This again illustrates the ease whereby one may make an error in diagnosis in these cases which so closely simulate the symptoms of malignant neoplasms.

Albrecht has suggested that if an apparent benign abdominal tumor is palpable and the patient is obese with evidence of lipomata on the body elsewhere, a lipoma of the gastro-intestinal tract should be suspected. He further states that this is a diagnosis which is rarely made before operation.

Poston, reporting on the incidence of lipomata as the cause of acute enteric intussusception, states that lipomas of the gastro-intestinal tract are not only uncommon conditions but also that enteric intussusception due to this benign new growth is very rare. He further states that diagnosis of a benign new growth in the alimentary canal must always be a matter of difficulty, and usually its presence is not suspected until a laparotomy is performed for some condition of which it may or may not be the cause.

Pollosson and deRougemont presented a syndrome for diagnosis of a benign new growth which offers a fairly good clinical picture. First, the patient has several attacks of abdominal pain of such severity that he remembers each attack, and he suffers from borborygmi and colicky pain at regular intervals. Second, he has complete abdominal relaxation with no distention and no rigidity, and the pulse and temperature remain normal. Third, a tumor may be felt at this stage, but appendicitis or a similar inflammatory condition can be ruled out, as such conditions cannot form a swelling in a few hours. Then with the onset of hemorrhage, obstruction, and intussusception the symptoms due to these conditions will appear. These writers also emphasize the importance of abdominal palpation under anesthesia.

Kent and Sawyer state that the long duration of symptoms, the polypoid nature of the benign lesion, together with the less frequent evidence of weight loss and bleeding is suggestive but not proof of a benign rather than a malignant lesion. They also state that the most common diagnosis is carcinoma but they feel this is not serious in that the bowel is prepared for resection. These writers feel that all patients should have preoperative preparation even if the lesion is known not to be malignant. They again emphasize the importance of vaccination with colon and streptococcus vaccine intraperitoneally about three days before operation on any patient in whom it may be necessary to open the colon.

Kirshbaum writes there are no symptoms characteristic of a lipoma of the intestinal tract but occasionally constipation is evident. Usually they are silent until signs of obstruction are present. He also states that diagnosis of submucous lipoma of the intestinal tract is practically never made during adult life.

METHOD OF STUDY

This paper is based upon a study of twelve cases of submucous and intramuscular lipomata of the large and small intestines which occurred in adults, and which produced symptoms of partial or complete intestinal obstruction. This series of cases includes all cases of this nature which were operated on at the Mayo Clinic up to and incluidng the last case which was operated on in April 1939. This study is based on the records from the Mayo Clinic and on a pathological and histological study of the specimens which were removed at the time of the operation. The stain, hematoxyllin and eosin, was employed in the microscopic study of these specimens.

Comfort reported three cases of submucous lipomas with symptoms which had been seen at the clinic up until 1928. Pemberton and McCormack also reported three cases of submucous lipomas of the colon and rectum, with symptoms, which were seen at the clinic up until 1935. I am adding six new cases which have been seen at the clinics, making a total of twelve cases of submucous and intramuscular lipomas, causing symptoms, for which surgery was indicated and performed at the Mayo Clinic.

Reports of many other cases in the literature have been studied and a brief resumé of the findings and conclusions are discussed.

CASE HISTORIES

Case 1. A white female aged sixty-eight years registered at the Mayo Clinic on March 6, 1939. For the past ten years she has been having intermittent periods of diarrhea with some slight pain in the left side of the abdomen. The pains had been more severe the past two or three years. Also during the past two or three years she had noticed intermittent periods of diarrhea with bleeding. These attacks of cramp-like pain associated with diarrhea, vomiting, and bloody stools lasted about twelve to twenty-four hours and the episodes occurred from one to several months apart. There had been from ten to twelve watery bowel movements with the last attack.

Physical examination was entirely normal except for the examination of the abdomen, which revealed a left lower quadrant tenderness and a questionable cord-like mass in the left iliac fossa. On bimanual examination a mass could be palpated at the junction of the sigmoid and the descending colon.

Stool examination was negative for parasites and ova but numerous R.B.C.'s were present. Roentgenologic studies of the colon revealed a large polypoid lesion in the region of the junction of the descending with the sigmoid colon. The roentgenologist also reported the tumor to be pedunculated and freely movable in fluoroscopic examination.

Exploration of the abdomen revealed a large polypoid lesion in the upper part of the sigmoid. Because of the large size of the polypoid growth, measuring 5 or 6 cm. in diameter, it seemed better to exteriorize the growth as a first stage Mikulicz operation, rather than to try to remove it by transsigmoidal excision. Ten days later the second stage Mikulicz operation was performed. The exteriorized lesion was removed by cautery excision and one Pemberton clamp was applied to the colonic spur. The pathologist reported a submucous lipoma 4 by 2.5 by 2 cm. The patient's general condition was good on dismissal, following the closure of the colostomy.

Pathological examination of the specimen revealed a pedunculated lipoma of the descending colon measuring 4 by 2.5 by 2 cm. which is attached by a broad base measuring 2 cm. in diameter. Near the attachment of this lipoma there are numerous other lipoid deposits in the wall of the bowel as seen grossly. One is unable to determine whether this fatty tissue is a true lipoma or merely fat cell deposits. These deposits might well be potential lipomas as it is easy to visualize how this collection of fat cells could change into a lipoma. The mucosa which is reflected over the tumor is ulcerated near the surface.

Microscopic sections through the periphery of the tumor show the absence of mucous memberane covering the lipoma. The tumor itself appears as normal compact adult fat tissue lobules which are held together by a network of connective tissue septa. The microscopic study of this lipoma as to its relationship with other structures of the bowel wall revealed the true position of the tumor, namely a submucous lipoma. (See Fig. 1.)

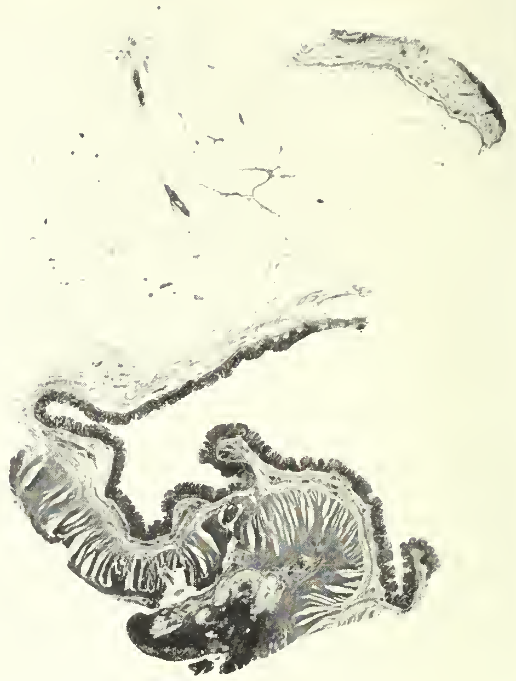
Fig. 1. Relationship of lipoma to the mucosa and muscularis layers.

Case 2. A white male, age fifty-eight years, registered at the Mayo Clinic on February 22, 1934. For about three months before he came to the Mayo Clinic he had had attacks of diffuse abdominal pain which had been colicky in character and had lasted from a few minutes to several hours. The pain had not been related to food and there had not been any vomiting, diarrhea or bloody stools. For two weeks before he came to the Mayo Clinic the pain had been localized in the left side of the abdomen and examination of his stools had revealed occult blood. He had lost some strength and 9 pounds of weight since the onset of his illness.

Physical examination revealed a well preserved man who had mild hypertension. His weight was 176 pounds, normal weight 185 pounds. There were no palpable abdominal masses. Roentgenologic examination of the colon revealed a polypoid lesion 3 by 3 cm. in the descending colon at the splenic flexure.

An exploratory laparotomy was performed under combined spinal and inhalation anesthesia. In the first part of the descending colon a questionably malignant polypoid mass was felt. Examination of the liver did not reveal metastasis. An exteriorization operation, obstructive type, was performed with difficulty and about 14 cm. of the splenic flexure and the descending colon was removed. The pathologist reported a sessile submucous lipoma which measured 3 by 2.5 by 3 cm. At the second stage of the operation, the colonic stoma was closed over a large rectal tube. At operation the tumor was partially intussuscepted and no doubt the recurrent attack of partial intussusception had been the cause of the symptoms. Here again there was a question of malignancy, age, weight loss, and occult blood pointing to this diagnosis. However, the polypoid nature of the lesion deferred the diagnosis as far as the roentgenologist was concerned. Symptoms were due to intermittent intussusception.

Pathological examination of the specimen by the author revealed a sessile lipoma of the descending colon measuring 3 by 3 by 2.5 cm. There was a distinct dimpling of the serosa present, probably caused by the dragging or tension on the lipoma during the act of repeated partial intussusception. The mucosa which reflected over the tumor was only partially intact.

Microscopic sections through the outer part of the tumor revealed the absence of the mucosa. The tumor was composed of normal adult fat cells. On further close microscopic examination of the lipoma, in regard to its exact position in the intestinal wall, it was noted that the inner circular muscle layer of the intestines was reflected over the lipoma as well as the mucosa; therefore, accurately placing the origin of the lipoma between the inner circular and outer longitudinal muscle layers of the bowel. (Fig. 2.) Consequently, we can now consider this tumor as an intermuscular lipoma instead of a submucous lipoma.

Case 3. A female, age sixty-five years, registered at the Mayo Clinic on May 16, 1935. For five or six weeks the patient had attacks of left lower quadrant pain which usually came on in the afternoon and lasted from six to seven hours. The pains were somewhat crampy. She vomited four or five times. Her appetite was good and there was no weight loss. Bowel movements were normal.

Physical examination revealed a well developed white female. Physical examination of the abdomen and chest were negative. Protoscopic examination was negative for 24 cm. After barium enema the roentgenologist reported a large polypoid lesion in the ascending colon near the hepatic flexure, probably carcinoma, and he also reported a definite tendency toward intussusception of the tumor.

Preoperative diagnosis was carcinoma of the hepatic flexure. Under spinal and inhalation anesthesia the patient's abdomen was explored through a right rectus incision. There was found in the ascending colon just below the hepatic flexure a large tumor which felt like a lipoma. The loop of bowel including the tumor was brought outside of the abdomen (without interfering with the blood supply) as a first stage Mikulicz resection. About twelve days later a second stage Mikulicz operation was done, removing the loop of bowel containing the lipoma. The pathologist reported a submucous lipoma 5 by 4 by 4 cm. with 8 cm. of colon (hepatic flexure). About two months after the original operation a closure of the colostomy was performed.

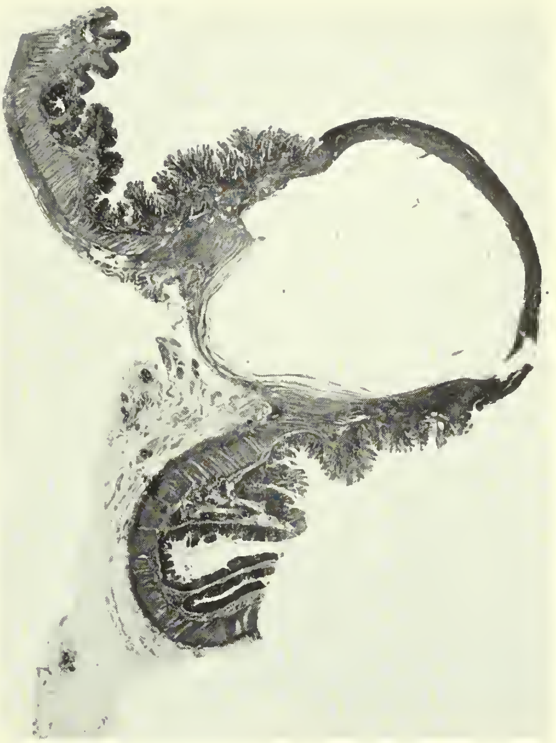

Fig. 2. Relation of the tumor to the mucosa and muscularis layers. The lipoma is intermuscular, i. e., between the inner circular and outer longitudinal muscles.

Pathological examination of the specimen by the author revealed a sessile lipoma of the hepatic flexure of the colon measuring 5 by 4 by 4 cm. The mucosa reflected over the tumor and on gross examination there was noted an area of ulceration about 0.5 cm. in diameter.

Microscopic sections through the periphery of the tumor revealed normal mucosa as well as the inner circular muscular layer covering the lipoma. There was the one area of ulceration as noted previously which showed on microscopic examination an inflammatory exudate. The tumor itself was made up of normal adult fat tissue. At the base of the lipoma the microscopic section further showed the relation of the tumor to the other layers of the intestinal wall. This showed where the inner circular layer of muscle reflected over the lipoma and demonstrated that in this case the lipoma was intermuscular in its origin and not submucosal as previously described by most authors. (Fig. 3.)

Case 4. A male, age fifty-four years, registered at the Mayo Clinic on September 25, 1914. His chief complaint was bowel trouble. Six years prior to his registration, for a period of five months, there were spells of constipation alternating with diarrhea, and soreness in the left lower quadrant of the abdomen. When he was constipated there had been a palpable mass in the left lower quadrant. However, the mass had disappeared following the action of a cathartic. The diarrheal stools had contained blood and mucus. No further trouble had

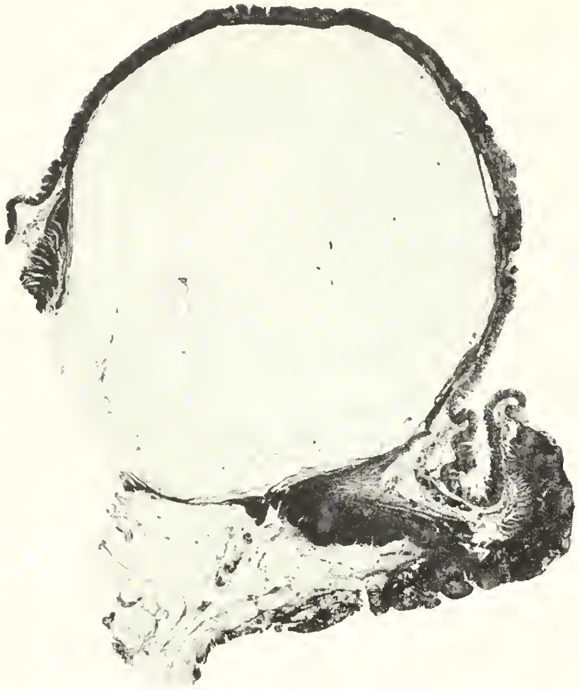

Fig. 3. Relation of the tumor to the mucosa and muscularis layers. The tumor's location is intermuscular, i. e., between the circular and longitudinal muscles.

occurred until three months before registration when he began having griping pains in the lower part of the abdomen with a sense of obstruction in the left lower quadrant and stools composed largely of mucus with some blood. There was no vomiting but the patient had a twelve pound weight loss.

Physical examination revealed a well-developed male. There was a movable, ridge-like mass 10 to 15 cm. long in the left lower quadrant of the abdomen. Roentgenological examination after a barium enema disclosed an obstruction in the descending colon. A diagnosis of carcinoma of the sigmoid and diverticulitis was made.

At operation it was found that intussusception had been present and had been reduced spontaneously before operation. A mass was palpated in the upper part of the sigmoid close to the descending colon. Resection of 25 cm. of the sigmoid and an end-to-end anastomosis were performed.

The obstructing nature of this tumor was apparent and the age of the patient and loss of weight were compatible with both carcinoma and a benign tumor. The later symptoms pointed to carcinoma. However, if the early distress could have been proved to be the result of the tumor, it would have pointed to a non-malignant growth. The convalescence of the patient was uneventful.

Pathological examination of the specimen revealed a tumor of the upper part of the sigmoid measuring 3 by 4.5 by 3.5 cm. The mucosa reflected over the tumor was normal in appearance for a distance of 1.5 to 2 cm., and the remaining lobulated surface of the tumor was covered by a bluish yellow smooth layer.

Microscopic sections showed the reflection of the mucosa over the surface of the tumor. Microscopic sections of the periphery of the tumor where the mucosa was absent revealed a well organized exudate covering the surface of the tumor.

Case 5. A white female, age thirty-seven years, registered at the Mayo Clinic November 22, 1933. For the past six years the patient had had vague pains in the epigastrium and lower abdomen which seemed to be more severe on the right side. She never had any nausea. She had been constipated for several years.

Physical examination revealed an undernourished white female. Examination of the abdomen revealed slight tenderness in the right upper quadrant, also slight tenderness and a small mass in the right lower quadrant. On bimanual examination a mass 3 to 5 cm. in diameter was palpated in the region of the right broad ligament. The pelvis was re-examined two days later and at this time no mass in the right lower quadrant could be felt. In spite of the vague complaints and the now negative pelvis, gallbladder and stomach roentgenograms were done and they were reported negative. The pelvis was re-examined two days after the last examination and at this time there was noted again a cystic mass in the right lower quadrant which was felt to be out of the pelvis and in the region of the cecum. A roentgenogram of the colon was then made which revealed a filling defect involving the ileocecal area.

Under spinal anesthesia the abdomen was explored through a low midline incision. There was found an intussusception of the terminal ileum about 14 to 16 inches above the ileocecal juncture. The intussuscepted portion of the bowel had become invaginated for approximately 8 cm. and was easily reduced. When this was done it was seen that a second intussusception had occurred in a portion of tissue which appeared to be a large Meckel's diverticulum. It extended at right angles to the wall of the ileum at that point for approximately 5 cm. and it was 2½ cm. in diameter at the base and about 3 cm. long. At the tip a portion of fat had intussuscepted into the bowel. It was impossible to reduce this and a segmental resection of the ileum was done with an end-to-end anastomosis.

The pathological report was an inverted submucous lipoma 4 by 3 by 2 cm. producing a partial intussusception. General condition was good at time of dismissal.

Examination of the specimen revealed a tumor of the ileum 4 by 3 by 2 cm. The site of attachment measured 3 cm. long by 2½ cm. in diameter. The mucosa, submucosa and muscularis mucosa were reflected over the tumor and appeared grossly normal. Microscopic examinations revealed a distinct ulceration of the mucosa. Also, the microscopic study of the lipoma with relation to the other structures of the bowel wall revealed its position to be submucous in origin.

Case 6. A white female, age fifty-eight years, registered at the Mayo Clinic October 18, 1937. For the past nine months the patient had been troubled with a slight pain in her right upper quadrant. This pain was dull, burning in character, not related to quality or quantity of food. A barium enema two months prior to admission showed a circular filling defect in the right half of the transverse colon, which was interpreted as a possible polypoid adenoma of the transverse colon. Just prior to her coming to the clinic, her family physician re-rayed the colon and the same polypoid mass was visualized in the first part of the transverse colon. The patient did not complain of diarrhea, constipation, or mucus and blood in the stools. The constant burning pain increased steadily for the past nine months and there was a twenty pound weight loss and some pallor but no loss of appetite.

Physical examination revealed a white female who was not acutely ill, complaining of a constant right upper quadrant burning pain. Roentgenologic studies of the colon revealed a mild ulcerative colitis of the cecum and the ascending colon and also a polypoid lesion (lipoma) 2.5 cm. in diameter in the transverse colon near the hepatic flexure.

This patient was operated on through a right paramedian incision. On exploration of the abdomen, the terminal 6 inches of the ileum, the ascending and the transverse colon were found to be slightly thickened. The surgeon reported the presence of a definite inflammatory process. The lesion in the hepatic flexure of the colon was a lipoma which was about 2 cm. in diameter. The lipoma was removed through a transcolonic approach and the opening closed transversely.

The pathologists report a lipoma from the colon measuring 2 by 2 by 1 cm. and examination of the specimen by the author revealed a solitary lipoma in the hepatic flexure of the colon. The mucosa was reflected over the tumor and was normal in appearance, no evidence of ulceration of the mucosa being present. The covering of the tumor was composed of mucosa, submucosa and muscularis mucosa. No evidence of the muscularis propria was present. It is assumed from this study that this lipoma was truly submucous in origin.

Case 7. A white male, age fifty-one years, registered at the Mayo Clinic October 14, 1932. Nine years prior to admission to the clinic he had had an attack of acute left lower abdominal pain and this was followed by the formation of a mass in the left lower abdominal quadrant. He had been ill for five or six days and after he had passed something "that looked like a part of bicycle inner tube" the mass had disappeared and he had obtained relief. However, for the next year and a half he had felt weak and "run down" and unable to work. He had been constipated ever since. For the past year he had had a slight short cramp-like abdominal pain, chiefly in the right lower quadrant lasting only a few minutes at a time. There had not been any loss of weight.

There was found on physical examination a small man who weighed 115 pounds. The general examination was essentially negative except for slight generalized abdominal distention and tenderness. No masses could be palpated. Roentgenologic examination of the colon revealed a multilobular mass at the right colonic flexure and a slight tendency to intussusception.

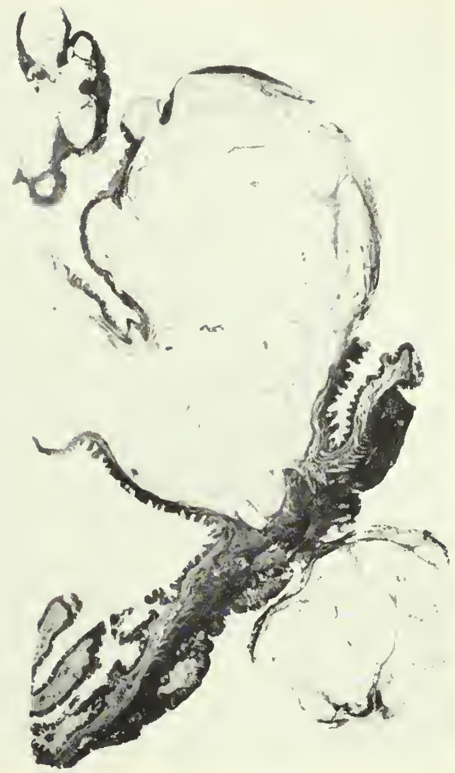

Fig. 4. Photomicrograph through specimen and bowel wall showing both the intramuscular and the subserous lipomas. Note relationship of lipoma to the mucosa and muscularis coats of the bowel, also the hypertrophy of the muscularis.

Exploration of the abdomen through a right rectus incision revealed a soft multilobular mass, apparently a lipoma, which was about 5 by 7 cm. in size and situated in the hepatic flexure of the colon. There was no evidence of malignancy. The involved loop of the colon was brought outside of the abdomen without interfering with the blood supply, as the first stage of a Mikulicz resection.

Ten days later 8 cm. of colon which contained the growth was removed with the cautery. The pathologist reported a submucous polypoid lipoma which measured 6 by 7 by 5 cm. About two months after the original operation, the bowel was separated down to the peritoneum without opening the peritoneal cavity and the colostomy was closed.

Pathological examination of the specimen by the author revealed a multilobular polypoid tumor measuring 5 by 7 by 6 cm. situated at the hepatic flexure of the colon. The tumor involved the mucosa and muscularis coats of the bowel and projected into the lumen. (Fig. 4.) The mucosa which reflected over the tumor was normal in appearance for a distance of 2 to 3 cm. but the remaining lobulated surface of the tumor appeared to be ulcerated and somewhat hemorrhagic.

Microscopic sections through the periphery of the tumor revealed many areas of ulceration. On further microscopic sections it was found that in addition to the mucosa, submucosa and muscularis mucosa there was a portion of the inner circular muscle of the bowel which was reflected over the tumor. The remaining portion of the circular muscle extended across the base of attachment as a thin layer. This points to the origin of this lipoma as intramuscular or within the inner circular muscle itself.

Case 8. An undernourished white female, age thirty-nine years, registered at the Mayo Clinic on June 3, 1926, complaining of severe attacks of upper abdominal pain. This patient's illness dated back about one year when she began to notice bloating of the abdomen with distention and distress in the epigastrium after meals. This continued until about three months prior to registration when she was suddenly seized with a severe attack of acute epigastric pain with nausea and vomiting. She had three such attacks, the last one two weeks prior to registration. Nausea and vomiting were continuous for five days, the emesis being a greenish bitter fluid. Following the severe pain, the residual soreness of the right side was marked. Appetite was poor after this last attack, and the bowels were obstinately constipated. No jaundice, fever or chills occurred.

Physical examination revealed an under-nourished, very pale white female of thirty-nine whose weight had decreased from normal of 130 pounds to her present weight of 105 pounds. Palpation of the abdomen revealed a large firm mass in the cecum and ascending colon which was freely movable and a diagnosis of carcinoma of the colon (hepatic flexure) was made. No anemia was present but weight loss of twenty-five pounds was noted. Roentgenologic studies of the colon showed a filling defect at the hepatic flexure with marked obstruction to barium enema.

Under inhalation anesthesia the abdomen was explored and there was found what was thought to be a carcinomatous polypoid type of tumor of the hepatic flexure, the size of a large lemon. A first stage Mikulicz operation was performed, bringing the hepatic flexure out and sewing the transverse colon and the ascending colon together ready for clamps after cutting off. About seven days later a second stage Mikulicz operation was performed, cutting off the growth. About one month later operation for closure of the Mikulicz was performed and the colostomy was completely closed. The pathological report, after the second stage Mikulicz, revealed a pedunculated submucous lipoma 5 by 4 by 4 cm. together with 10 cm. of transverse colon.

Pathological examination of the specimen by the author revealed a pedunculated lipoma attached to the transverse colon. The mucosa which reflected over the tumor appeared to be ulcerated and absent in spots. A microscopic section near the base of the tumor shows the angle of reflection of the mucosa and the greatly hypertrophied muscle in this area (Fig. 5). This hypertrophy of the muscle is no doubt due to the stress from the pedunculated tumor. Also in Figure 5 it can be noted how the mucosa, muscularis mucosa and submucosa reflect over the lipoma but the muscularis extends across the base of attachment as a thick hypertrophied layer. This shows the origin of the lipoma to be truly submucous.

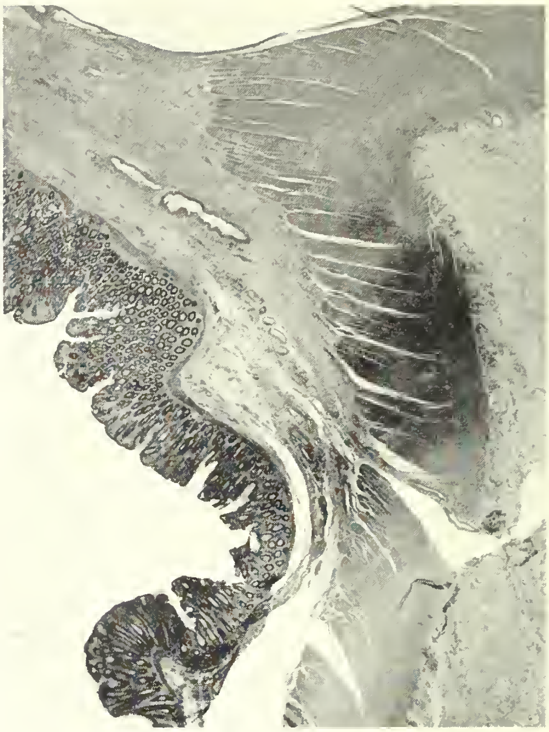

Fig. 5. Photomicrograph showing reflection of the mucosa, submucosa and muscularis mucosa over the tumor. Also note hypertrophy of muscularis coat and its exact relation to the tumor.

Case 9. A white female, age forty-three years, registered at the Mayo Clinic November 30, 1928. The patient had had indefinite pain in the epigastrium for a month every spring and summer for the past seven years. For the last month prior to registration she had quite severe, mid-epigastric pains which radiated to the upper two-thirds of the left side of the abdomen; vomiting every two or three days; and a foul diarrhea one day. However, she was constipated for the most part since the onset of the trouble. A round, firm mass, 10 cm. in diameter, slightly movable, in the left upper quadrant to the left of the umbilicus, was discovered five days prior to registration.

Physical examination revealed a well developed, well nourished white female, age forty-three years, who had had a weight loss of seventeen pounds in the past several months.

The examination of the urine and the blood were essentially negative except for a somewhat lowered hemoglobin—64 per cent. On examination of the abdomen there was found a large, rounded, smooth, movable mass in the left side of the abdomen near and opposite the umbilicus. The rest of the physical examination was essentially negative. The following day, after the use of the ounce of castor oil by the patient, the abdominal mass was absent but a questionable smaller mass high in the ascending colon was palpated. On a subsequent examination the main abdominal mass appeared to be in the right side of the abdomen to the right of the umbilicus. A roentgenologic study of the colon revealed a polypoid filling defect distal to the ascending colon and was reported as probably a malignant tumor. There was no gross bleeding from the bowel, but in view of the attacks of progressive increasing constipation and the mild anemia, exploration was advised.

Under spinal anesthesia the abdomen was explored through a right rectus incision and a polyp-like tumor the size of a small orange was found in the cecum. The colon, pelvis and small bowel were normal and there was no evidence of metastasis in the liver. It was thought best by the surgeon to do a two stage resection. Thus, an end-to-side anastomosis was made 6 or 8 inches from the ileocecal valve between the terminal ileum and the transverse colon. About nineteen days following the first stage operation, the abdomen was again opened through the old incision and a resection of the cecum and ascending colon and ileum was accomplished. The pathological report was 9 cm. of ileum, cecum and ascending colon with a pedunculated lipoma (4½ by 4 by 3 cm.) of the cecum. Her convalescence was very uneventful and she returned home.

Pathological examination by the author revealed a pedunculated lipoma of the cecum, measuring 4.5 by 4 by 3 cm. The tumor involved the mucosa and muscularis coats of the bowel wall and projected into the lumen. The mucosa reflected over the tumor appeared to be ulcerated. There was also noted a marked dimpling of the serosa, probably due to traction at the time of intussusception.

Microscopic sections through the periphery of the tumor revealed an ulceration. It was also found that in addition to the mucosa, submucosa, and muscularis mucosa there was a portion of the inner circular muscle of the bowel which was reflected over the tumor. The remaining part of the circular muscle together with the outer longitudinal muscle coat extended across the base of the attachment. This showed that the origin of this lipoma was intramuscular or within the circular muscle itself. There was also noted the hypertrophy of the muscularis coat at the base of attachment and the increased vascularity just at the base of attachment (Fig. 6.) The tumor proper was composed of normal adult fat tissue.

Case 10. A well developed, obese white female, age forty-three years, registered at the Mayo Clinic on April 3, 1939. She had had a gallbladder type of dyspepsia for about two years with fullness, bloating and belching coming on about one hour after meals. For the last eight months prior to registration she had had recurring attacks of abdominal colic sometimes occurring as often as two or three times a day. At first, pain started in the upper quadrant but later the pain began in the right upper quadrant, from whence it radiated over the whole abdomen and directly through to the back. At no time did she notice jaundice, fever, chills, or clay colored stools. X-ray diagnosis of gallstones was made in December, 1938, by her local physician. There was no constipation or diarrhea and no evidence of blood in her stools.

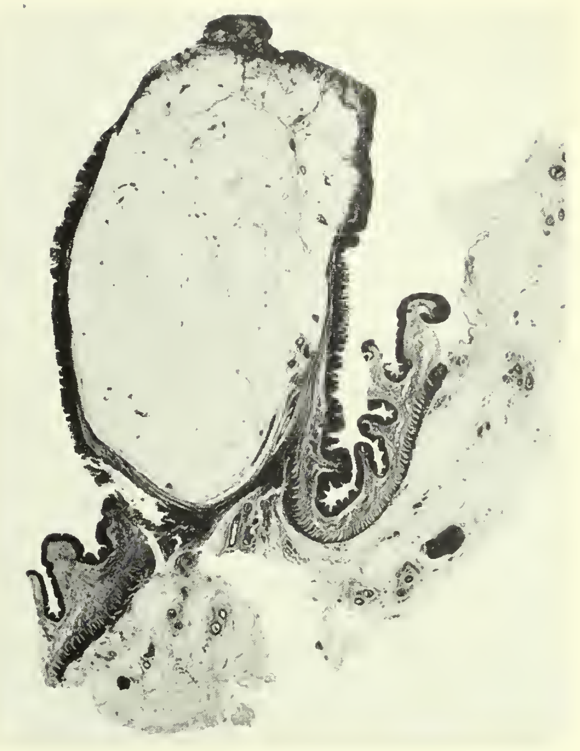

Fig. 6. Photomicrograph through the intramuscular lipoma and the bowel wall. Note ulceration of mucosa at periphery, the relation of the tumor to the muscularis, the increased vascularity, and the muscle hypertrophy at the base of the tumor.

Physical examination revealed a very obese but healthy-looking female. Examination of the abdomen revealed a relaxed, non-tender, obese abdomen and a questionable elongated mass palpable in the right lower quadrant which was thought at examination to be the cecum. X-ray of the gallbladder revealed that it was non-functioning and contained stones. In view of the above findings, the surgeon thought it advisable to perform a cholecystetcomy and at the time carefully examine the cecum.

The patient was operated on under inhalation anesthesia. It was found that the movable mass which could be felt before the operation in the region of the cecum was a pedunculated tumor projecting into the lumen of the ascending colon. As the tumor was thought to be probably malignant, it was thought best to remove it. About 4 inches of the terminal ileum, cecum, ascending colon and about one-half of the transverse colon were resected, making a side-to-side anastomosis. There were multiple stones in the gallbladder, and according to the surgeon, the patient probably had had more trouble from

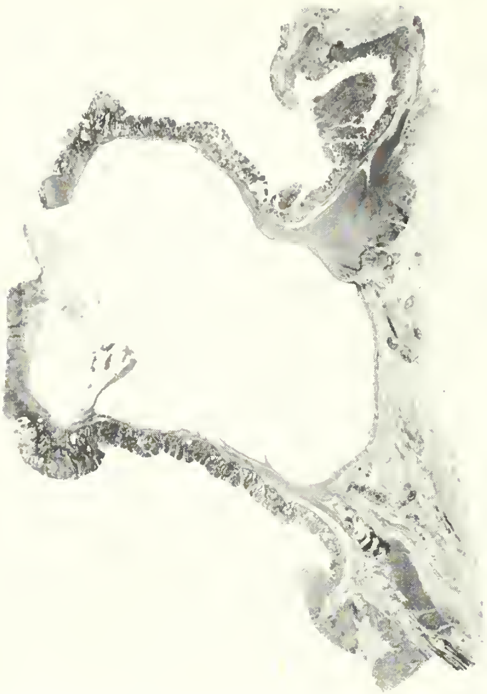

Fig. 7. Photomicrograph through intramuscular lipoma. Note ulceration of surface and relation of lipoma to the mucosa and muscularis coats of the bowel wall.

these than from the tumor in the bowel; however, this is a questionable deduction. Since it would not add much to the risk of the operation it was thought advisable to do a cholecystectomy at the same time.

Pathological examination revealed chronic catarrhal cholecystitis with multiple facetted mixed stones, and a pedunculated lipoma of the cecum measuring 5 by 4.5 by 5 cm., which was attached by a base measuring about 4 cm. in diameter. The tumor involved the mucosa and the muscularis coats of the bowel and projected into the lumen. The mucosa which reflected over the tumor was normal in appearance for a distance of about 5 cm., but the remaining outermost surface was ulcerated.

Microscopic sections through the periphery of the tumor revealed an ulceration of the mucosa. Further, on section it was found that in addition to the mucosa, submucosa and muscularis mucosa there was a portion of the inner circular muscle of the bowel which also reflected over the tumor. The remaining portion of this circular muscle extended across the base of attachment as a thin layer (Fig. 7). This demonstrates the site of origin of this lipoma to be intramuscular, or within the inner circular muscle itself.

Case 11. A well developed white female, age forty-eight years, registered at the Mayo Clinic March 10, 1936. On admission she complained of extreme tenderness in the right mid-abdomen with definite muscle rigidity. There was no fever, but findings suggested an inflammatory process which was encroaching upon the bowel, inasmuch as she complained of slight obstructive symptoms at times.

Physical examination revealed a well developed and nourished white female complaining of extreme pain, tenderness and rigidity on the right side of the mid-abdomen. No mass was definitely palpated but there was a sensation of a deep mass. Roentgenologic study (a stasis X-ray) of the colon revealed a large pericecal mass.

Operation on the abdomen was performed under inhalation anesthesia through a low right rectus incision. The patient was found to have a lipoma of the cecum with intussusception causing partial obstruction. There was a great deal of inflammatory thickening of the peritoneum in the ileocecal region. The possibility of malignancy was considered and so it was thought advisable to resect about 3 inches of the terminal ileum, the cecum, ascending and several inches of the transverse colon. A side-to-side anastomosis of the ileum and the transverse colon was made.

Pathologic examination revealed a submucous lipoma of the cecum measuring 6 by 5 by 4 cm. The tumor appeared to involve the mucosa and the muscularis coats of the bowel wall and it projected into the lumen. The mucosa reflected over the tumor was normal in appearance except for an area of ulceration 1 by 2 cm. on the surface of the tumor.

Microscopic sections through the periphery and near the ulcerated area revealed a muscular layer which intervened between the mucosa and the lipoma proper. This was the inner circular muscle layer which in this case reflected over the tumor with the mucosa, submucosa and muscularis mucosa. This demonstrated the site of origin of this lipoma as between the circular and longitudinal muscle layers, or as intermuscular. The longitudinal muscle, which was hypertrophied, extended across the base of attachment of the tumor (Fig. 8).

Case 12. A well nourished white female, age sixty-four, registered at the Mayo Clinic September 3, 1930. The patient's illness dated back four years prior to operation for diverticulitis. After the operation she did well for two years when she began to have typical attacks of right upper quadrant colic. During the last year the attacks had been getting progressively worse and more frequent. She had never had any jaundice, fever or chills with these attacks. Between attacks she felt extremely well, with no indigestion, but said she was intolerant to fats and fried foods. She had a tendency to be constipated, but no diarrhea or bloody stools. Her blood and urine were negative, also a roentgenologic examination of the colon revealed negative findings.

In view of the clinical history, the patient was operated on for cholecystitis with cholelithiasis on July 5, 1930, elsewhere. Following this operation she had three attacks of pain in the epigastrium, with vomiting, which was rather severe and radiated to the back. She said these attacks were similar to those she had had before the operation. After returning home, the patient continued to have severe attacks of epigastric pain with

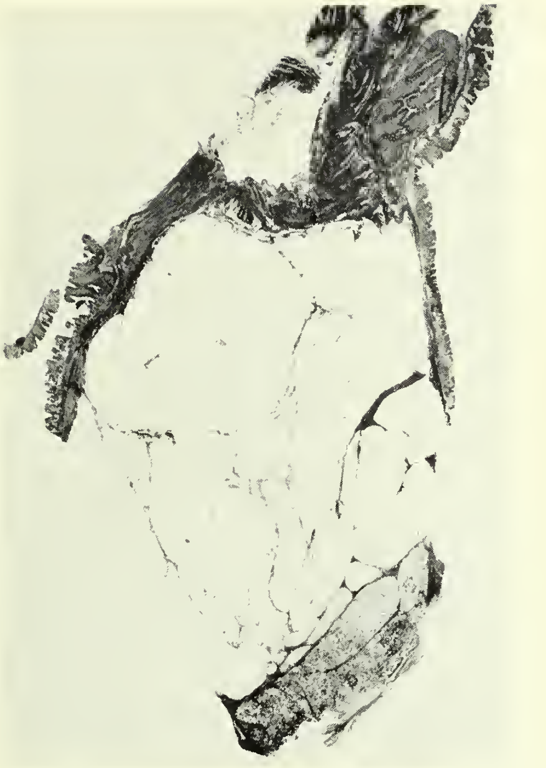

Fig. 8. Photomicrograph through intermuscular lipoma and bowel wall. Note area of mucosal ulceration and relation of tumor to muscularis coat.

vomiting and during these attacks an abdominal tumor could be palpated at the level of the umbilicus. The lump disappeared after the attack and could not be palpated ad interim. These attacks occurred about once a week for two months prior to registration.

Physical examination on admission revealed a rather weak white female who complained of severe epigastric pain of three or four hours duration. She vomited bile-colored water once and was prostrated from severity of the pain. The pain was located about the umbilicus and epigastrium but did not radiate. There was no distention of the abdomen at this time but a small, definitely movable, not tender mass was palpated to the left of the umbilicus which could be pushed about in the abdomen. The examination of the blood and urine was essentially negative except for a lowered hemoglobin, which value was 60 per cent. Stool examinations were positive for occult blood.

Roentgenologic study of the small bowel and the colon showed no evidence of small bowel obstruction and the colon was reported negative distal to the hepatic flexure. A diagnosis of intermittent intestinal obstruction was made and under inhalation anesthesia the abdomen was explored. There was found a marked dilatation and hypertrophy of the upper eight or nine feet of the bowel. About three feet from the origin of the jejunum there was a tumor within the lumen of the bowel about the size of a man's thumb. It was attached by a pedicle and could be moved up and down the bowel for a distance of about 12 cm. When it was pushed down in the lumen, the pedicle became taut and there was a definite tendency to intussusception. The attachment of the pedicle to the wall of the bowel could be readily located by gentle traction on the tumor and the bowel was then opened opposite this point. The tumor measured 5.5 by 2.5 by 2.5 cm. and it was easily brought out of the lumen of the bowel. Its pedicle was then clamped near its origin, the tumor removed, the pedicle sutured and the bowel was then closed.

Examination of the specimen which was removed at operation revealed a pedunculated tumor which measured 5.5 by 2.5 by 2.5 cm. The mucosa, submucosa and muscularis mucosa which reflected over the tumor was normal in appearance except at one point where there was an ulceration of the mucosa.

Microscopic study through the periphery of the tumor where the mucosa was intact revealed normal mucosa and an absence of any inflammation. It was further noted on sections through the periphery of the tumor that only the mucosa, submucosa and muscularis mucosa were reflected over the lipoma. There was no evidence of the muscularis coat reflecting over it. This establishes the site of origin of the tumor as submucous.

Discussion

The case reports herein presented reveal the following facts:

Pain is the most common symptom and its average duration prior to the patient's registration at the clinic was three years and three months. The longest period with pain was nine years and the shortest period was two months.

Vomiting and constipation were present in six of the twelve patients.

Diarrhea was not a common symptom but it was present intermittently in four patients.

Occult blood was found microscopically or by chemical tests in five patients but in only one was gross blood noticed.

There was found to be a definite weight loss in eight of the patients up to as much as twenty-five pounds, also there was a questionable weight loss in the four remaining patients.

On physical examination a mass was palpable in the abdomen in eight of the twelve cases and the tumor was demonstrated by the roentgenologist in every case. The tumors were located either on the permanent films or were visualized and palpated on fluoroscopic examination.

Partial or complete intestinal obstruction as well as intussusception are frequent sequelae of these intestinal lipomas. Definite and marked obstruction was present in all but two cases and intussusception or a tendency to intussusception was present in seven of the twelve cases. In one case where the lipoma was rather small but causing symptoms there was an associated inflammation of the bowel in this area, as noted by the surgeon. In this case there was no apparent obstruction to the lumen of the bowel. Ulceration of the mucosa covering the tumor was found microscopically in every case except one. In spite of this high incidence of ulceration gross or occult blood was found in only five cases even after repeated examinations.

As reported in the literature these tumors occur most commonly in the colon; this was confirmed by this series of twelve cases. Seven lipomas were found in the colon, three in the cecum and one each in the jejunum and the ileum. Also according to the literature these tumors usually present themselves between the ages of fifty and fifty-nine years. In this series the average age was fifty-three years. It is important to remember in the differential diagnosis that these tumors present themselves during the so-called "cancer-age."

Lipomas should always be kept in mind and considered as a cause of vague intestinal symptoms and especially should be thought of as a cause of chronic or acute ileus.

In spite of the constant positive roentgenologic findings of obstruction or filling defects in these cases roentgenologic studies are actually of little value in determining the nature of these lesions.

A lipoma may be pedunculated, sessile, or flat in character and they are nearly always composed of adult type of fat cells. The tissue which surrounds the lipoma may be connective tissue derived from the mucosa and submucosa or it may be derived from the muscularis coat of the intestinal wall. In the past most all investigators have considered lipomas which protrude into the lumen of the bowel as submucous in origin. Bland-Sutton, upon noticing dimpling of the serosa as a result of traction, believes that nearly all lipomata are subserous in origin. However, in this series of twelve cases it was found that six were truly submucous in origin, that is the mucosa, submucosa and muscularis mucosa were the only coats of the bowel which reflected over the tumor. In three of the twelve cases the site of origin was established as being intramuscular, that is, within the inner circular muscle. Microscopically it was shown where the fibers of the inner circular muscle of the intestine separated with a portion of the fibers together with the mucosa, submucosa and muscularis mucosa reflecting over the lipoma and the remaining portion extending across the base of attachment of the tumor. In the remaining three cases the site of origin of the lipoma was demonstrated to be intermuscular, that is, between the inner circular muscle and the outer longitudinal muscle of the intestinal wall. In these three cases the entire circular muscle with the mucosa, submucosa and muscularis mucosa reflected over the lipoma while the outer longitudinal muscle extended over the base of attachment of the tumor. Therefore, the lipomas may be classified as submucous, intramuscular, intermuscular, or subserous in origin.

These lipomas are surrounded over their free surface by normal intestinal mucosa unless there has been severe pressure injury or trauma or infarction of the tumor, in which case the mucosa may become atrophic, necrotic or ulcerated. All but one case in this series showed some degree of ulceration and necrosis of the mucosa. This was determined by gross study and multiple microscopic sections through the periphery of the tumor. The microscopic picture of ulceration was that of a definite exudative layer which was in direct contact with the tumor. In some cases this exudate was undergoing organization or was completely organized with much evidence of new capillary formation. Also in this exudate layer there was demonstrated a large amount of inflammation, as evidenced by numerous lymphocytes and polymorphonuclear leucocytes. Occasionally hemorrhagic areas were found in the periphery of the tumors with the presence of many red blood cells intermingled with the inflammatory cells. The frequency of ulceration as seen in this series could be explained on pressure injury or trauma. This is especially true in cases of partial obstruction where trauma would be produced by the food and waste products passing over the tumor which is encroaching on the lumen of the bowel. Also pressure injury, as occurs in cases of recurring intussusception or complete bowel obstruction could account for the ulceration. Another explanation for the ulceration could be infarction. This could and might occur from the increased pressure exerted by the tumor in its growth and development, thereby obliterating the blood vessels which are vital for the proper nourishment of the surface of the tumor.

The tumor itself appears as normal compact fat lobules which are held together by connective tissue septa. In the lipomas where ulceration is present, inflammation can be noticed extending far down into the connective tissue septa. This is evidenced by the presence of numerous lymphocytes and an increased thickness of this stroma.

At the base of the tumor, the most significant finding was the hypertrophy of the muscular layer as seen by both gross and microscopic examination. This hypertrophy is probably best explained on the basis of the normal hypertrophy of any muscle when the work of that muscle is increased. There is no doubt that the stress and strain of a pedunculated tumor is considerable at the base of its attachment.

I was unable to arrive at any explanation for the etiology or formation of these lipomas. I was able to visualize microscopically and occasionally grossly, fatty infiltrations in the intestinal wall which were scattered about the area of the lipoma, and I feel that Comfort is correct when he states that the development of collections of fat cells into single lipomas can be a possible explanation for the origin of lipomas.

Kent and Sawyer state that it is conceivable that these lipomas could occur as a part of one of the degenerative diseases involving a disturbance of fat metabolism such as arteriosclerosis or diabetes. However, even though lipomas have been observed in many cases of disease or atrophy of the thyroid gland, in obesity, and in alcoholism, it does not appear that such constitutional conditions have any direct bearing on the etiology of true lipomas according to Curling, Madelung and Koettnitz.

A congenital tissue predisposition seems to be an essential factor in the origin of most lipomas and this predisposition may take the form of a disturbance of development of the fat tissue according to Ewing. However, he also states that a more definite embryonic disturbance is probably responsible for the origin of many lipomas of the internal organs, as for example in the kidney, where misplaced islands of capsular fat are held to give rise to tumors.

Treatment of all these lipomas with clinical symptoms is surgical removal, especially if obstruction has taken place. If the diagnosis is made with certainty and this is rarely done preoperatively or at the time of operation, local excision of the growth when not too extensive is the method of choice. There were no deaths in this series of patients and follow-up letters in many reveal complete recovery.

Conclusions

1. A series of twelve cases of lipomas of the large and small intestines, which produced symptoms and which were removed surgically, has been presented.

2. Lipomas occur more commonly in the large intestines and the average age at which they present themselves by producing symptoms was fifty-three years in this series.

3. Pain was the major symptom and its average duration prior to coming to the clinic was three years and three months. Vomiting associated with pain was present in over half of the cases. Diarrhea and constipation was very variable. There was definite weight loss in the majority of cases.

4. Ulceration of the mucosa covering the lipomas was present in all but one case. This can be explained on pressure injury as in intussusception or trauma as in partial obstruction, or on infarction as from pressure on the blood vessels from the growth and development of the tumor. In spite of the incidence of ulceration the finding of blood in the stool was very infrequent.

5. In this series, six lipomas were found to arise in the submucosa, three had their origin between the inner circular and the outer longitudinal muscles of the intestinal wall, and three had their origin within the inner circular muscle. Therefore the lipomas now may be classified as submucous, intramuscular, intermuscular and subserous in origin.

6. No satisfactory explanation for the etiology of lipomas was arrived at by this study. A congenital tissue predisposition or the presence of a definite embryonic disturbance as mentioned by Ewing are plausible explanations.

7. Diagnosis of a lipoma is rarely ever made preoperatively and in many cases the preoperative diagnosis is that of malignant neoplasm. This frequent error is due to the obstructing nature, the age of the patient, the loss of weight and other similar symptoms which these conditions exhibit.

8. Treatment is surgical. Local excision of the growth and direct closure or anastomosis is the ideal procedure when the lesion is not too extensive. Another procedure commonly carried out is a resection of the segment of bowel which contains the tumor.

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Acute Bronchiolitis in Children

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THE condition known as acute bronchiolitis, or capillary bronchitis, is a syndrome characterized by rapid, labored respirations, audible wheezing, cyanosis, pulmonary emphysema, and prostration with an unusually viscous fibrinous exudate in the terminal bronchioles leading to obstructive dyspnea and asphyxiation terminally. The terms bronchitis, capillary bronchitis, asthmatic bronchitis, or simple bronchopneumonia have been applied to this syndrome in the past. Bronchiolitis is more descriptive since it is this portion of the respiratory tract which is primarily involved. Some writers deny this entity a separate existence. This view is expressed by Norris and Landis[1] (1938): "The latter term (i. e., bronchiolitis) should never be used. While a lesion limited to the finer bronchioles is possible theoretically, practically it never exists alone, as an inflammatory process invading the swollen bronchi inevitably extends to the anatomically related and contiguous vesicles as well. The term 'bronchiopneumonia' is much the more preferable designation, and by common consent is the one now in general use." It is very difficult to share this view when one has seen dyspneic and cyanosed children die in asphyxia. Holt and McIntosh[2] (1933), for example, express a contrary opinion when, in an account of acute bronchiolitis in children, they write, "The symptoms, however, are due chiefly to a bronchitis which extends to the smallest tubes. Fibrinous exudate, and in some cases edema, cause obstruction with great respiratory distress."

Acute bronchiolitis occurs most frequently in infants 3 to 18 months of age and is relatively infrequent in children over four years of age. The use of the sulfonamides and penicillin, proper supportive measures, and good nursing care have greatly reduced the number of deaths from the common forms of bronchopneumonia in infants and children. Nevertheless, the usual mtehods of treatment may not prevent death in this form of primary bronchopneumonia which has been designated acute bronchiolitis. The treacherousness of this condition and the need for prompt, specially modified treatment make it worth while to consider acute bronchiolitis separately from the other types of bronchopneumonia.

PATHOGENESIS

The syndrome of acute bronchiolitis is probably produced by any agent capable of causing an acute inflammatory reaction in the bronchioles; however, it is more frequently seen when influenza of a respiratory type is epidemic. It is not limited to any age group, but it is in the children under the age of two years that the attacks may be so often overwhelming. This may depend on a defective local resistance in the absence of any acquired immunity; often another factor appears to be the heightened virulence of an invading organism in its passage through several hosts, for the baby is usually the last member of the household to contract a catarrhal infection.

Blake and Cecil[3] have produced pulmonary lesions in monkeys with pure cultures of H. Influenzæ bacilli which are quite similar to those observed by Trask and others in man. H. Influenzæ type B is felt to play a most important role in acute bronchiolitis. In the majority of instances, this type of pneumonia is the result of two infectious agents which act synergistically or one is superimposed upon the other. The various viruses which are pathogenic in the respiratory tract such as those of influenza, measles and those associated with atypical primary pneumonia may act synergistically with certain bacteria, notably H. influenzæ, certain of the Viridans group of streptococci and the higher types of pneumococci. Trask[4] stated that the outstanding features of the autopsy series in children is the predominance of mixed infections.

Hubble and Osborn[5] consider acute bronchiolitis to be related to infections with the virus of influenza. Greengard, Raycraft and Frank[6] and also Pratt[7] noted the occurrence of epidemics of bronchiolitis which is suggestive of a specific causative agent.

PATHOLOGY

Brief comment on the pathologic changes is useful for the understanding of the clinical signs and especially for the planning of treatment.

The basic pathologic process is inflammation of the entire thickness of the walls of the bronchioles, resulting in a spread of the inflammatory reaction to the interstitial tissues around the bronchioles, blood vessels and lymphatics, and into the walls of adjacent alveoli. This process leads to a progressive lymphangitis and to involvement of the alveolar spaces. Such changes are essentially those described by McNeil, MacGregor and Alexander[8] in cases of bronchopneumonia.

On gross examination the lungs are voluminous with considerable emphysema in the anterior and upper portions. They are two to three times their normal weight. Edema and congestion account for most of this increased weight. The lungs have numerous blotchy purplish areas with increased firmness. The cut surface reveals purulent material in the bronchi and bronchioles which have thickened walls and protrude from the general surface. In most cases, small areas of consolidation are seen surrounding the bronchioles. Generally, the pleural surfaces are smooth with dilated subpleural lymphatics. The lymph nodes around the trachea and bronchi are swollen to three to four times their usual size. Generally, there are no additional outstanding gross findings in other organs, except for toxic reaction in lymphatic structures

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and considerable increase in the weight of the brain, which is congested and edematous.

Microscopic examination of sections from the lungs of patients with acute bronchiolitis shows the bronchiolar lumens to be filled with mucus and necrotic debris. The entire wall of the bronchioles is infiltrated with polymorphonuclear and especially mononuclear cells. A similar infiltration is present around the blood vessels and lymphatics. There is congestion, edema and infiltration of the alveolar walls. The alveolar spaces are generally clear except close to the affected bronchioles. In these areas the alveolar spaces contain an inflammatory exudate. In some cases the alveolar spaces throughout the lungs contain edema fluid or hemorrhagic exudate. Sections of the heart muscle may show edema and increased numbers of fat droplets. Microscopic examination of the central nervous system usually discloses only vascular congestion and edema of the cells and extracellular spaces.

Clinical Features

Acute bronchiolitis usually appears as a primary disease. The onset may be acute, with fever, very rapid and labored breathing, and prostration; but more often for a day or two the child has slight fever, cough and some gastro-intestinal upset before the infection extends. As the infection descends, the larynx may next be affected with hoarseness, brassy cough and stridor due to laryngeal spasm. From this phase the child may pass quite suddenly into bronchiolitis. The bronchioles become obstructed and the clinical picture is that of obstructive dyspnea. Respirations are exceedingly rapid, from 80 to 100 per minute. Dyspnea is marked with recession of all the soft parts of the chest during inspiration. Wheezing respiration is often audible and laryngeal obstruction is closely simulated, although the obstruction is in the terminal bronchi. Cough is usually severe and often incessant. Prostration is not so great as in the usual forms of pneumonia. The picture is that of respiratory obstruction and anoxia, as seen in asthma, rather than a toxemia. Cyanosis is often obvious quite early but becomes extreme before the end. Collapse is usually terminal, but sometimes the toxemia may be profound and the child quickly becomes apathetic and stuporous. The characteristic clinical picture is distressing and unforgettable: the head turning restlessly from side to side on the pillow, the dusky cyanosis of the lips and cheeks, the expression concentrated but unprotesting, the wildly distressed breathing, the relentless cough, and the final apathy.

The physical signs are dominated by the poor air exchange in the lungs. Percussion reveals hyper-resonance, sometimes a tympanitic note, owing to the emphysema which is present. Auscultation reveals extremely poor air exchange in the lungs, everywhere the respiratory murmur is very feeble. At first there are sibilant rales with squeaks and wheezes all over the chest as in asthma, suggesting bronchiolar spasm. Later there are sub-crepitant and fine moist rales scattered over both lungs, particularly toward the hila, mingled with coarse moist rales everywhere. Every type of rale may be heard, but there is no evidence of consolidation. The response to adrenalin is poor, only partial or no relief is obtained.

The course varies considerably. A child acutely ill may be well and without symptoms in three days. On the other hand, the symptoms may increase until on the third or fourth day the patient dies of exhaustion and anoxia. Cyanosis is marked and prostration increases rapidly, the temperature may rise to 106° or 107° before the end. In cases which do not prove fatal there is usually improvement by the fourth day, and by the end of one week the patient is on the way to recovery. The fine rales give way to the coarse rales of an ordinary bronchitis when the acute phase is over, and this may persist for a few days. Sometimes consolidation develops, occasionally a whole lobe is consolidated.

The white blood count is not uniformly altered. A moderate leukocytosis is present in about one-half the patients. A leukocyte count of less than 6000 per cubic millimeter is present in a few instances; a normal count in about one third of the cases. The remainder of the blood studies and the urine examination reveals no significant changes. Cultures from the nasopharynx and throat produce the usual pathogens in no characteristic pattern. Beta hemolytic streptococci, pneumococci Staphylococcus aureus and Hæmophilus influenzæ are usually present in various combinations. Occasionally only one of these organisms is isolated, and in rare cases no bacterial pathogens are detected. Blood cultures are almost always sterile.

Roentgenograms of the lungs reveal certain charateristic changes.[9] The most uniform alteration is emphysema involving all portions of the lungs. Bulging of the emphysematous lung tissue into the interspaces is a prominent feature. There is an increase in the bronchovascular markings and varying degrees of peribronchial infiltration. Small patches of pneumonic consolidation or atelectasis may be seen close to the hili and towards the bases. Close inspection of the films reveals irregularity of aeration with multiple small areas of emphysema, surrounded by normal or partially atelectatic lung tissue. Such irregular aeration is due to varying degrees of bronchial and bronchiolar plugging. The mediastinum is not displaced. Fluoroscopic examination is apt to be deceptive, since the lung fields appear unusually bright and no large areas of increased density are seen. However, the observations that the diaphragm is depressed and moves very little, and that the thoracic cage appears to be fixed in the position of extreme inspiration will aid in a correct interpretation.

Therapy

"All bronchial therapy is futile," wrote the great Osler, dying of an influenzal infection; and this deathbed pronouncement has a papal quality. The treatment of patients with acute bronchiolitis consists of attacking the infection, the obstructive dyspnea, the oxygen lack and the provision of general supportive measures.

Infection. Since there are probably a variety of agents producing the infection, no single therapeutic measure gives uniform results. However, bacterial infection plays an important role in many cases; mixed infections are the rule.

Sulfadiazine. Sulfadiazine is effective against most of the commonly encountered organisms. 0.1 gram per kilogram of body weight, initial dose, then 0.2 gram per kilogram of body weight daily in six divided doses is administered orally and maintains a blood concentration of from 10 to 15 mgm. per cent in the blood. It may be administered subcutaneously by use of the sodium salt in a ½ per cent solution in physiological saline. 0.1 gram per kilogram of body weight is given every eight hours subcutaneously. This is the method of choice in extremely ill infants and maintains a blood concentration of the drug of from 15 to 25 mgm. per cent. A minimum daily intake of fluid of 100 cc. per kilogram of body weight should be maintained while the drug is being administered or else hematuria will result. Sodium bicarbonate is no substitute for an adequate fluid intake. We have found that if an adequate output of urine is maintained, infants rarely have renal complications from sulfadiazine, even when no alkali is given.

Penicillin. Penicillin should be administered in dosage of 1,000 units per kilogram, intramuscularly, every three hours, although it is not as effective as in the more common forms of bronchopneumonia. This is due to the fact that H. Influenzæ plays such an important role in bronchiolitis.

Streptomycin. Streptomycin is quite effective against H. Influenzae and may be employed to a great advantage in acute bronchiolitis. It is not necessary in all cases but certainly should be tried in the more severe ones. It is administered in the dosage of from one-tenth to two-tenths gram, intramuscularly, every three hours, depending upon the size of the child.

Respiratory Obstruction. Steam and air with a relative humidity of 95 per cent to 100 per cent has proved to be the most useful single agent in relieving respiratory obstruction and should be used continuously. Pratt[7] reports that the use of mechanical humidifiers, such as described by Davison,[10] has many advantages over steam. At the Doernbecher Memorial Hospital for Children we have found steam most effective, and because of its availability, steam will continue to be used much more extensively.

Spasm of the bronchi and bronchioles is often present and is occasionally relieved by doses of adrenalin, 2 to 3 minims subcutaneously every 30 to 60 minutes. Some observers feel that employing benadryl or pyribenzamine early in the attack may abort the disease. Benadryl is used in dosage of 10 mgm., three or four times daily, and pyribenzamine is used in dosage of 25 mgm., three or four times daily. In the fully developed disease, we at the Doernbecher Hospital have found these drugs to be of little value. Aminophylline, usually given in combination with 50 per cent dextrose intravenously, has been found to be more effective in most cases; satisfactory therapeutic effects with doses of 0.006 gm. per kilogram of body weight, combined with 2 cc. per kilogram of body weight of 50 per cent dextrose, given slowly intravenously. This mixture may be repeated every six to eight hours if effective, but should be discontinued if there is any tendency towards thickening of the secretions. In this regard, atropine, by thickening the secretions, tends to produce atelectatic plugs and has no place in the treatment of acute bronchiolitis in infants. Intermittent use of 5 per cent carbon dioxide in oxygen for five minutes every two to three hours helps liquefy the mucus and relieve atelectatic plugs. Expectorants, such as the iodides, are of little value but may be tried. Pharyngeal suction and postural drainage may prove of benefit. Great care should be exercised in the use of sedatives. Restlessness due to respiratory obstruction should be treated by relieving the obstruction and not by sedatives. Since practically maximal respiratory efforts are necessary in order to provide sufficient pulmonary ventilation to sustain life, opium derivatives or other respiratory depressants are to be avoided.

Oxygen Lack. In nearly all cases, except the mildest, there is diminished oxygenation of the blood. Anoxemia contributes to the escape of fluid from capillaries, especially in the lungs and central nervous system. Hence, oxygen therapy should be instituted early and freely. However, oxygen tends to thicken the bronchiolar secretions. It should, therefore, be used in combination with moist air. The administration of oxygen by means of a nasal catheter is efficient and economical, but difficult to keep in place in restless infants. Small open-topped oxygen tents in a room filled with moist air are highily satisfactory. To insure desired concentrations one must measure the oxygen concentration of the inspired air.

General Supportive Measures. Much is accomplished by proper nursing care in order to maintain the proposed therapy and to provide the maximum of comfort and rest for these patients. Abdominal distention is treated by return-flow enemas, heat or cold to the abdomen, and in certain cases prostigmine, 4 to 16 minims of a 1:4000 solution subcutaneously. Blood or plasma transfusions are of use, both to maintain the oxygen-carrying capacity and the osmotic properties of the blood, and to provide nonspecific antibodies. Excessive or too rapid administration of parenteral fluids to patients with acute bronchiolitis may cause greater respiratory distress. Generally, adequate amounts of fluids, 120 to 170 cc. per kilogram of body weight per day, can be given by mouth, supplemented daily with one or two hypodermoclyses consisting of equal parts of 5 per cent dextrose in water and physiological saline. Intravenous fluids may be necessary, but should be given cautiously. Excessive administration of sodium ions, parenterally or orally, is to be avoided. If metabolic acidosis is known to be present, one-sixth molar sodium lactate solution may be substituted for the saline in the subcutaneous fluids. Caffeine with sodium benzoate, ½ to 2 grains, or metrazol, 4 to 8 minims, may be used in the treatment of respiratory depression.

Summary

In summary, bronchiolitis in infants has been discussed with reference to the clinical features, the major pathologic changes, and probable etiology. A detailed plan of treatment for the various disturbances frequently encountered has been presented.

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Textbook of Clinical Neurology. Israel S. Wechsler, M.D. New (sixth) edition; 1947. 829 pages, 162 illustrations, some in color. Philadelphia: W. B. Saunders Co. Price $8.50.

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This is the newest edition of a complete, concise and clearly presented text on modern neurology with specific bedside and office application. The author, who is Clinical Professor of Neurology at Columbia University and Neurologist at Mt. Sinai Hospital, New York, and a foremost American teacher and specialist in neurology, has made numerous changes and additions. Care has evidently been exercised to insure that the new and improved therapeutic measures are included. These embrace the use of antibiotics in such conditions as skull fracture (to prevent infection), syphilitic meningitis, paresis, meningovascular neurosyphilis, etc. Other new approaches to the specialty dealt with are the use of tridione in petit mal, use of the encephalograph in the diagnosis of epilepsies and use of histamine and niacin in multiple sclerosis.

Long recommended as an ideal book for definite and specific guidance in diagnosis and treatment of nervous disorders, Wechsler's new edition lives up to the standard set by its predecessors. Practitioner and specialist alike will find it of constant value. J. N.

Rypins' Medical Licensure Examinations. *Topical summaries, questions and answers.* Sixth edition. Under editorial direction of W. L. Bierring, M.D., with the collaboration of a review panel. Philadelphia: J. B. Lippincott Company. 690 pages. 1947. Price $6.00.

- - - - - - - -

The new sixth edition of this standard review book intended for candidates of licensing examinations has progressed with the times and now includes for the first time a chapter on psychiatry. Recent advances such as the use of BAL are included.

The book is divided into two parts; the first covers the basic medical sciences—anatomy, physiology, chemistry, bacteriology, pathology and pharmacology. Part two, the clinical sciences: medicine, surgery, obstetrics and gynecology, hygiene and preventive medicine and psychiatry.

The editorial review panel includes J. E. Markee (anatomy and physiology); A. O. Gettler (Chemistry); M. Frobisher (bacteriology); H. Goldblatt (pathology); R. P. Walton (pharmacology); L. K. Ferguson (surgery); F. C. Lendrum (medicine); N. J. Eastman (obstetrics and gynecology); C. F. McKhann (hygiene and preventive medicine); and H. P. Rome (psychiatry).

The book can be recommended for anyone studying for medical licensure examination. H. W.

Injuries and Diseases of the Esophagus. G. Grey Turner. 100 pp. with index. Illustrated. London: Cassell & Co., Ltd. Price 15 shillings.

- - - - - - - -

The twelve chapters of this monograph comprise the George Haliburton Hume Memorial Lectures given by G. Grey Turner, in the Royal Victoria Infirmary, Newcastle-on-Tyne. The author is Professor of Surgery in the University of London at the British Postgraduate Medical School, and Consulting Surgeon to the hospital in which the lectures were delivered.

The subject matter includes discussion of congenital anomalies, diverticula, foreign bodies, chemical and other trauma, benign stricture, cardiospasm, inflammation, malignant and nonmalignant disease. The presentation is informal, the style simple, and the discussions are liberally embellished by case reports and personal experiences. Diagnostic mistakes and surgical faults are freely admitted, and performances of others generously acclaimed. Many sharp and valuable observations are casually hidden in the case anecdotes.

The author is revealed in these pages as a gracious, modest English gentleman with soft wit, keen perception, and great good sense. His small book is not only instructive but is pleasant reading. J. C.

. . . MEET OUR CONTRIBUTORS . . .

James F. Nolan, M.D., St. Louis, Missouri, specializes in obstetrics and gynecology; was graduated from Washington University, class of 1938; member, A.M.A., American Radium Society, St. Louis Gynecological Society, and the St. Louis Medical Society.

Wallace E. Herrell, M.D., Mayo clinic, specializes in internal medicine and chemotherapy; is associate professor of Medicine, University of Minnesota; is a graduate of the University of Virginia, M.D., 1933, and M.S. in Medicine, University of Minnesota, 1937; Fellow, A.M.A. and American College of Physicians; member, Minnesota State Medical Society, Central Society for Clinical Research, American Federation for Clinical Research, Society for Clinical Investigation, and the American Therapeutic Society.

Robert J. Tenner, M.D., Minneapolis, specializes in surgery; is a graduate of the University of Minnesota, class of 1936, M.B., M.D., M.S. in Surgery; is assistant clinical instructor in surgery, University of Minnesota Medical School; member, attending staff of Fairview, Abbott, St. Barnabas and Swedish hospitals; Fellow, American College of Surgeons, diplomate, American Board of Surgery; member, Hennepin County and Minnesota State Medical Societies, Minneapolis Surgical Society, Minneapolis Academy of Medicine.

John DeWitt Schonwald, M.D., is Director, Student Health Service, Miami University, Oxford, Ohio; was graduated from Jefferson Medical College, class of 1909; member, Ohio State Medical Society, A.M.A.

John H. Benward, M.D., Portland, Oregon, Assistant Professor of Pediatrics, University of Oregon, and Assistant Medical Director of the University of Oregon Hospitals and Clinics, was a contributor to the December issue of Journal-Lancet.

The JOURNAL LANCET

Official Journal of the

American Student Health Association
Great Northern Railway Surgeons' Association
Minneapolis Academy of Medicine
North Dakota State Medical Association
Northwestern Pediatric Society
Sioux Valley Medical Association
South Dakota Public Health Association
South Dakota State Medical Association
North Dakota Society of Obstetrics and Gynecology

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REFERENCE BOOKS IN PSYCHIATRY

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Outline of Psychiatry—White.
Textbook of Psychiatry—Henderson & Gillespie
Textbook of Psychiatry—Noyes.
Clinical Psychiatry—Strecker & Ebaugh.
Child Psychiatry—Kanner.
Psychosomatic Medicine—Weiss & English.
Psychobiology and Psychiatry—Muncie.
Handbook of Military Neuropsychiatry—Solomon & Hakovlev.
*Emotions and Bodily Changes—Dunbar.
Contemporary Psychopathology—Tomkins.
History of Medical Psychology—Zilboorg.
Basic Writings (Modern Library Giant)—Freud.
The Human Mind—Menninger.
*The Mentally Ill in America—Deutsch.
Sexual Variants—Henry.
Escape from Freedom—Fromm.
Beyond the Clinical Frontier—Strecker.
Psychopathic States—Henderson.
A Mind That Found Itself—Beers.
Our Age of Unreason—Alexander.
*Treatment in Psychiatry—Diethelm.
A Review of the Psychoneuroses at Stockbridge—Coon & Raymond.
*The Care of the Patient—Peabody.
Therapy of the Neuroses and Psychoses—Kraines.
The Patient as a Person—Robinson.
The Art of Treatment—Houston.
*A Way of Life—Osler.
As the Twig is Bent—Hohman.
*Discovering Ourselves—Strecker & Appel.
Managing Your Mind—Kraines & Thetford.
*Psychotherapy in Medical Practice—Levine.
Psychiatry in War—Mira.
Neuroses in War—Miller.
Psychological Effects of War on Citizens & Soldier—Gillespie.
Men Under Stress—Grinker & Spiegel.
War Neuroses in North Africa—Grinker & Spiegel.
Instincts of the Herd in War & Peace—Trotter.
*The Common Neuroses—Ross.
The Neurotic Personality of Our Time—Horney.
New Ways in Psychoanalysis—Horney.
Our Inner Conflicts—Horney.
*Bodily Changes in Pain, Hunger, Fear and Rage—Cannon.
Energies of Man—MacDougall.
*Foundations of Neuropsychiatry—Cobb.
*Borderlands of Psychiatry—Cobb.
*Nervousness, Indigestion & Pain—Alvarez.
Facts and Theories of Psychoanalysis—Hendricks.
Love Against Hate—Menninger.
Man Against Himself—Menninger.
Mind, Medicine and Man—Zilboorg.
*Psychosomatic Diagnosis—Dunbar.
The Medical Value of Psychoanalysis—Alexander.
Modern Man in Search of a Soul—Jung.
The Mask of Sanity—Cleckley.
Psychology of Insanity—Hart.
Alcohol. One Man's Meat—Strecker & Chambers.
Autobiography of a Purpose—White.
20th Century Psychiatry—White.
Personality in Formation and Action—Healy.
Psychoanalysis and Medicine—Stephens.
Common Neuroses of Children and Adults—English & Person.
Psychology of Women, Vols. I & II—Deutsch.
*The Substance of Mental Health—Preston.
*The Happy Family—Levy & Monroe.
*Emotional Habits of Living—Pearson & English.
*Psychiatry for the Curious—Preston.
The Person in the Body—Hinsey.
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HEALTH AND RECREATION FACILITIES IN AMERICAN COLLEGES

The American Council on Education recently put out a questtionnaire concerning college enrollment, veteran enrollment and veterans families. The summary of this questionnaire regarding health and recreational facilities is as follows:

	Public	Private	Total
Colleges reporting	161	141	302
1. *Day Nurseries for children of veteran's families*			
a. Having	39	7	46
b. Not having	119	131	250
c. No answer	3	3	6
d. Attendance	1,152	71	1,223
2. *Counseling Service provided for Student Veterans*			
a. Having	149	121	270
b. Not having	9	15	24
c. No answer	3	5	8
3. *Recreational Facilities on campus and in communities for students and dependents*			
a. Adequate	60	54	114
b. Not adequate	74	48	122
c. No need	24	33	57
d. No answer	3	6	9
4. *Recreational facilities in housing units for married students*			
a. Adequate	24	22	46
b. Not adequate	65	28	93
c. No need	23	39	62
d. No answer	49	52	101
5. *Assistance wanted in providing recreational facilities and workers*			
a. Wanted	86	57	143
b. Not wanted	16	20	36
c. No need	30	32	62
d. No answer	29	32	61
6. *Nursing Services provided in homes of veterans' families*			
a. By college:			
(1) Yes	12	17	29
(2) No	148	122	270
(3) No answer	1	2	3
b. By other agencies:			
(1) Yes	33	18	51
(2) No	106	92	198
(3) No answer	22	31	53
7. *Physician's services for veterans' families provided*			
a. By college:			
(1) Yes	17	19	36
(2) No	141	115	256
(3) No answer	3	7	10
b. By other agencies:			
(1) Yes	11	10	21
(2) No	133	100	233
(3) No answer	17	31	48
8. *Infirmary or hospital care for veterans' families*			
a. By college:			
(1) Yes	13	12	25
(2) No	145	126	271
(3) No answer	3	3	6
b. By other agencies:			
(1) Yes	12	9	21
(2) No	129	99	228
(3) No answer	20	33	53
9. *Services of nutritionist or home economist provided for veterans' families*			
a. Yes	28	15	43
b. No	130	116	246
c. No answer	3	10	13

Contributed by the American Student Health Association.

FACULTY-ENDOCRINE POSTGRADUATE ASSEMBLY

The following authorities, among others, have been invited to help make up the faculty for the forthcoming Endocrine Postgraduate Assembly to be held in Los Angeles February 23-28, 1948, under the auspices of the Association for the Study of Internal Secretions and the Journals *Endocrinology* and *Clinical Endocrinology*:

Dr. Edwin B. Astwood
Research Professor
of Medicine
Tufts College

•

Dr. J. S. L. Browne
Professor of Medicine
McGill University

•

Dr. Earle Engle
Professor of Anatomy
Columbia University

•

Dr. Frederick Fluhmann
Associate Professor
Obstetrics and Gynecology
Stanford University

•

Dr. Edward Hamblen
Professor
Obstetrics and Gynecology
Duke University

•

Dr. Roy G. Hoskins
Director
Neuro-endocrine Research
McCormick Foundation
Boston, Massachusetts

•

Dr. Hans Lisser
Clinical Professor
of Medicine
University of California

•

Dr. C. N. H. Long
Dean and Professor
of Medicine
Yale University

•

Dr. Cyril M. MacBryde
Assistant Professor
of Medicine
Washington University

•

Dr. E. Perry McCullagh
Chief, Department of
Endocrinology & Metabolism
Cleveland Clinic

Dr. James H. Means
Professor of
Clinical Medicine
Harvard University

•

Dr. Warren O. Nelson
Professor of Anatomy
Wayne University

•

Dr. Edward Rynearson
Member, Section on
Endocrinology & Metabolism
Mayo Clinic

•

Dr. Hans Selye
Professor of
Experimental Medicine
University of Montreal

•

Dr. M. H. Soley
Professor of Medicine
and Assistant Dean
University of California

•

Dr. Willard O. Thompson
Clinical Professor
of Medicine
University of Chicago

•

Dr. George Thorn
Hershey Professor
of Physic
Harvard Medical School

•

Dr. Henry Turner
Associate Professor
of Medicine
University of Oklahoma

•

Dr. Stafford Warren
Dean, School of Medicine
Universtiy of California
at Los Angeles

•

Dr. Howard West
Professor of Medicine
University of Southern
California

Applications for the course are now being received. See other notice in this journal.

UPPER MIDWEST NEWS

NORTH DAKOTA

Needs and possibilities of rehabilitating North Dakota children with cerebral palsy were demonstrated December 1 and 2 at the first cerebral palsy clinic held at the Crippled Children's School in Jamestown. Nearly forty children, selected from the state welfare department's list to demonstrate various types and degrees of cerebral palsy, were examined by Dr. Meyer A. Perlstein, Chicago specialist, in a "teaching clinic" for physicians, parents, nurses, therapists, and social workers. Fourteen physicians, 29 nurses, 24 other professional people, and nearly 150 parents and others interested were registered as in attendance from all over North Dakota. Dr. Perlstein complimented the Crippled Children's School at Jamestown as being one of the finest schools in the country for handicapped children.

The clinic was sponsored jointly by the North Dakota Medical Society, the State Public Welfare Department, and the Cerebral Palsy Council of the North Dakota Chapter. It was financed from funds received in the Easter Seal sale.

* * * *

New pathologist of Fargo clinic is Dr. John D. LeMar, native Nebraskan and World War II veteran who joined the clinic after a year as pathologist for the Veterans administration in Fargo.

Dr. W. B. Pierce of the Quain & Ramstad clinic was elected president of the medical staff of St. Alexius hospital at the December staff meeting. Dr. P. L. Owens of the Roan & Strauss clinic was named vice president and Dr. R. W. Henderson, secretary-treasurer.

Miss Edna G. Elmore, formerly assistant director in nursing service, Grace Hospital, Detroit, Michigan, has been appointed secretary of the North Dakota State Nurses' Association.

Dr. H. M. Waldren of Drayton gave the only privately owned hospital in North Dakota to the Sisters of St. Francis January 1, 1948. The Drayton hospital was founded 45 years ago by Dr. H. M. Waldren, Sr., and operated under his management until his death in 1944, when his son assumed management of the institution. The hospital was given as an outright gift to the sisters and Dr. Waldren said his only thought in making the gift was to keep the institution operating. He estimated value of the hospital at $20,000 and said the only stipulation he is making is that the hospital be operated for the good of the entire Drayton community.

Dr. G. G. Thorgrimsen of Grand Forks was elected president of the Grand Forks District Medical Society at a meeting of the group on December 17. Elected vice president was Dr. R. W. Vance; Dr. L. B. Silverman as secretary-treasurer. Both are from Grand Forks. Drs. R. E. Leigh of Grand Forks and Frank Weed of Park River were elected to represent this district at the state society, with Drs. N. A. Hardy of Minto and C. J. Glaspel of Grafton as alternates. Preceding the meeting, Dr. Walter Carley of St. Paul spoke on the treatment of neuropsychiatric patients.

SOUTH DAKOTA

Eight areas have been assigned class A priority for application for federal hospital construction funds under a state hospital construction plan, Dr. G. J. Van Heuvelen, acting health officer, announced. South Dakota has been allotted $359,000 for the first year of the five-year program. Federal grants will amount to one-third of construction costs, with the sponsor paying the remainder. Any non-profit organization or political subdivision may act as sponsor.

Research that applies to such diseases as infantile paralysis and blood vessel lesions will be the subject of some special work to be undertaken by the anatomy department of the University of South Dakota School of Medicine under a $5,000 grant made to the University by the Navy department, President I. D. Weeks announced. The research work will be under the direction of Dr. W. L. Hard, head of the anatomy department of the School of Medicine.

The annual fall meeting of the Yankton District Medical Society was held on October 30 at the State Hospital, with Superintendent and Mrs. F. W. Haas as hosts. The principal talk was given by Dr. N. G. Alcock, professor of urology at the University of Iowa, who spoke on the subject, "Hematuria." Dr. V. I. Lacey is president of the society and Dr. F. J. Abts is secretary-treasurer.

* * * *

The Sioux Valley and McKennan hospitals at Sioux Falls have been approved by the American Medical Association for the training of interns. First hospitals in South Dakota to win such approval, the Sioux Falls institutions are each preparing to give internship training to eight medical school graduates each year. While some internships are available immediately, the regular schedule will begin in July, 1948, an intern's year lasting from one July to the next.

Under a rotating internship plan, each trainee will spend three months on medicine, 1½ months in surgery, 1½ months in orthopedics, 1½ months in obstetrics, 1½ months in gynecology and urology, 1½ months in pediatrics and 1½ months in radiology and pathology.

Both hospitals have been working toward this goal by adding to their floor space and equipment, although it is generally recognized that the community is still in need of more hospital facilities.

"Under an intern setup," said Dr. L. J. Pankow, McKennan hospital's publicity chairman, "they will be able to offer greatly improved service to the public, as a graduate physician will be in attendance at all hours."

Dr. A. M. Harris, pathologist and chairman of the Sioux Valley hospital staff's internship committee, said: "This is an important thing for South Dakota in view of the much-discussed shortage of doctors. Interns tend

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POSTGRADUATE COURSE IN ENDOCRINOLOGY

The Postgraduate Committee of THE ASSOCIATION FOR THE STUDY OF INTERNAL SECRETIONS, under authority of its Council, announces a course of lectures and demonstrations in CLINICAL ENDOCRINOLOGY to be held in LOS ANGELES at the BILTMORE HOTEL, FEBRUARY 23 to 28, 1948, inclusive.

The faculty will consist of the most prominent researchers and clinical endocrinologists in the various branches of the medical sciences gathered from the United States and Canada.

It is the intent of the Committee that this course be a practical one of interest and value to the GENERAL PRACTITIONER AND SPECIALIST ALIKE.

A fee of $100 will be charged for the entire course and the attendance will be limited to 100. Registration will be in the order of checks received and will close on February 1, 1948. Should there be an insufficient number of applicants to warrant the course, the registration fee will be immediately refunded in full.

Please make your application on your letterhead and forward, together with your check payable to THE ASSOCIATION FOR THE STUDY OF INTERNAL SECRETIONS, to *DR. E. KOST SHELTON*, CHAIRMAN of the POSTGRADUATE COMMITTEE, 921 WESTWOOD BOULEVARD, LOS ANGELES 24, CALIFORNIA.

Since satisfactory hotel accommodations are still difficult to procure on short notice in Los Angeles, especially during the winter season, it is suggested that all applicants *make their reservations EARLY.*

SOME LARGE HOTELS IN THE METROPOLITAN AREA OF LOS ANGELES: Alexandria, Ambassador, Biltmore, Chapman Park, Gaylord, Hayward, Lankershim, Mayflower, Town House.

to practice in the localities where they take their training. South Dakota medical students will have an opportunity to take intern training without leaving their home state."

* * * *

Dr. Albert M. Harris, associate professor of pathology at the State University Medical School, has been selected by the American Society of Clinical Pathologists as counselor for South Dakota, according to Dr. Donald Slaughter, dean of the school. This is the first time a counselor has been appointed from South Dakota, the dean said. As counselor, Dr. Harris will approve memberships for the society from South Dakota and will represent the state at national meetings. Dr. Harris is pathologist at Sioux Valley hospital in Sioux Falls and is clinical director for medical technology students who take three years of work at the medical school and one year at Sioux Valley hospital.

CORRECTION

The news item which appeared in the October issue of JOURNAL-LANCET which stated that Dr. A. A. Armour of Chicago was employed to head the X-ray department at the Methodist State Hospital in Mitchell, South Dakota, is incorrect since this hospital does have a radiologist, Dr. Marianne Wallis, who is in complete charge of this department. Dr. Armour is chief laboratory and X-ray technician in charge of all other technicians at this institution.

MINNESOTA

Honoring the memory of the late Dr. Robert G. Green, former head of the department of bacteriology in the University of Minnesota's medical school, the Minnesota Cancer society has presented the University with a $5,000 grant to support a cancer research fellowship. Long an outstanding figure in cancer research work at the University, Dr. Green died Sept. 6, 1947.

Dr. F. L. Schade, Worthington, is the new president of the Southwestern Minnesota Medical Association. Other new officers are Dr. John Lohmann, Pipestone, president-elect; Dr. Gerrit Beckering, Edgerton, vice president; and Dr. B. O. Mork, Jr., Worthington, secretary-treasurer.

A cancer control advisory committee to work with the state health department was formed October 29 as the state started a campaign to halt the rising list of cancer deaths. Last year more than 4,000 persons died of cancer in Minnesota. Dr. A. J. Chesley, secretary and executive officer of the department, listed the advisory group as: Drs. A. H. Wells, Duluth; Clayton Swanson, D. W. Pollard, Owen H. Wangensteen, all of Minneapolis, and Kano Ikeda, St. Paul. Members at large are Drs. E. T. Bell and James Johnson, Minneapolis, William W. Will, Bertha, D. P. Anderson, Jr., Austin, W. C. Popp, Rochester, and Sister Patricia, St. Mary's hospital, Duluth.

Dr. Edwin J. Simons, chief of the medical services unit of the state division of social welfare, resigned

(Continued on page 36)

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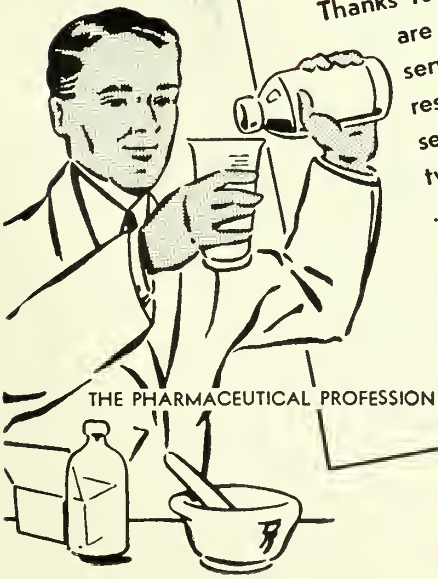

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October 21 to resume private practice of medicine at Swanville, where he has lived since his graduation from the University of Minnesota in 1925. He was president of the Minnesota State Medical Association in 1946 and has been active for years in state medical activities.

The Minnesota Society of Anesthesiologists was formed August 30, 1947. The following officers were elected: Ralph T. Knight, M.D., Minneapolis, President; T. Harry Seldon, M.D., Rochester, Vice-President; Frank Cole, M.D., Duluth, Secretary-Treasurer. All physicians interested in anesthesiology are invited to apply for membership in this society. Address such applications for membership to Frank Cole, M.D., (Chairman, Membership Committee), St. Mary's Hospital, Duluth.

The newly-organized Minnesota Heart Association, composed of eleven physicians and five laymen, has been officially recognized as an affiliate of the American Heart Association, Dr. Paul F. Dwan, president, announced in December. The group was organized November 1.

"After-effects of the atom bomb have been exaggerated," Dr. Irvine McQuarrie, head of the University of Minnesota's department of pediatrics, said December 16 on his return from a three-month study of medical education, research and hospitals in Japan for the Rockefeller Foundation. "I found cases of persons suffering from scars and anemia," Dr. McQuarrie said, "but their numbers were not as great nor their condition as serious as we had been led to expect." Dr. McQuarrie found Japan's health is impaired by inadequately trained doctors and some 80,000 quacks who practice blood-letting. Many so-called physicians were students hurriedly trained as a wartime expediency. They will be returned to medical school for another year and then given a period of internship. Because many of the hospitals and medical centers were housed in buildings built to withstand earthquakes, they stood up quite well against wartime bombings, Dr. McQuarrie said.

The Center for Continuation Study at the University of Minnesota is offering a two week course in Neurology from February 16 to 28, 1948. The course will be a complete and condensed review of basic neurology of value to neurologists, psychiatrists, and general practitioners. It is especially recommended for those who are preparing for board examinations in neurology or psychiatry. Dr. A. B. Baker, Associate Professor of Neurology, is in charge. The course will be taught by members of the staff of the University of Minnesota Medical School, the Mayo Foundation, and outstanding lecturers from other medical centers. Tuition is $25 per week. To make application, write to the Center for Continuation Study, University of Minnesota. There will be some living space available at the Center for Continuation Study, and hotel reservations will be made for those whom the Center cannot accommodate.

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Dr. George F. Parker, the Director of Health Service at DePauw University, reports that he has resigned his position to enter private practice at the end of the current school year. He is anxious to find a capable physician to take his place.

Deaths

Dr. H. G. Harris, 70, practicing physician in Wilmot, South Dakota, for over 41 years, died October 1.

Dr. Arnt G. Anderson, 66, of Minneapolis, where he had practiced for all but ten years of his professional career, when he practiced in Hillsboro, North Dakota, died November 1. Dr. Anderson was on the staffs of Swedish and Deaconess hospitals and was surgery consultant at the Ebenezer Home infirmary.

Dr. E. J. Kepler, 53, staff member of the Mayo Clinic, Rochester, died October 20.

Dr. Robert Meyer, 83, German-born gynecologist, and one of the world's greatest figures in medicine, died in Minneapolis on December 12. Regarded as the "father" of research in gynecology, Dr. Meyer held a position in his field often compared to Freud's prominence in psycho-analysis. He came to Minneapolis after being hounded out of his position as professor at the University of Berlin by the Nazis in 1939, serving on the University of Minnesota staff as clinical professor. He resigned several months ago because of failing health.

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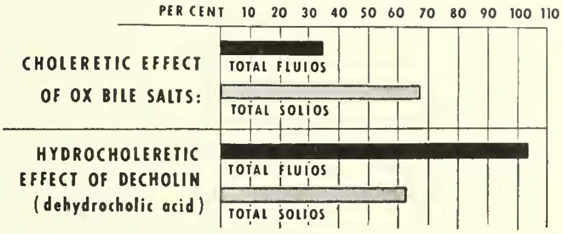

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Ivy, A. C., et al: Am. J. Dig. Dis. 7:333 (Aug.) 1940.

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Advertisers' Announcements

Wyeth Wins Direct Mail Award

Wyeth, Incorporated, Philadelphia, was selected as a merit award winner in the pharmaceutical section of the 1947 direct mail advertising competition sponsored by the Direct Mail Advertising Association of New York.

Announcements of the awards was made at the DMAA annual convention at Cleveland recently. Wyeth direct mail advertising was cited in particular for its direct mail series entitled "Ulcer Lives of the Great," which is devoted to authenticated case histories of famous persons who were afflicted with peptic ulcer.

"Ulcer Lives of the Great," colorfully illustrated by Homer Hill, provide Wyeth with a new and arresting means of promoting its complete line of peptic ulcer products, such as Amphojel, Phosphajel, etc.

Each mailing piece carries a cover in full-color by Mr. Hill, which dramatizes a characteristic scene or episode from the lives of the great who were peptic ulcer patients. Celebrated persons treated in the series are: Thomas Carlyle, Charles Darwin, Napoleon, Thomas Huxley and Jean Darcet. So enthusiastic has been the response to the "Ulcer Lives of the Great" series, that plans are now under way to continue it in 1948.

Drugs Resist Price Spiral

Studies confirm claims that the drug industry stands alone in resisting current inflationary price spirals. The studies show that at least 4,377 items, produced by 250 manufacturers, distributed by wholesale druggists and sold in retail drug stores have remained unchanged in price since 1939.

A total of 7,334 individual items were surveyed. A decrease in prices was reported on 697 items, while there was an increase in the price of 2,260 items. On all items, including drugs, vitamins, cosmetics, toiletries and sundries, were the consumer to purchase one each in the year 1939 and again purchase one each in 1947, he would pay only 1.39 per cent more, according to the survey.

Pointed out were long-range price reductions on such important drugs as penicillin, 80 per cent; insulin, 65 per cent; streptomycin, 15 per cent; and sulphathiazole tablets, 68 per cent.

Were a consumer to purchase one each of 455 different vitamin preparations in 1939 and purchase one each of these same items in 1947, he would actually pay 32.52 per cent less.

Sales in 84 retail drug stores were tabulated in order to determine a weighting factor for each of the various commodity groups. On the basis of this weighting the actual price increase on drugs, cosmetics, toiletries and sundries, amounted to an increase of 3.12 per cent in 1947 over 1939, as against a food increase of 103.7 per cent, wearing apparel, 85.1 per cent, and house furnishings of 81.5 per cent.

"Invisible" Device Aids Hard-of-Hearing

The chief psychological obstacle to aiding the hard-of-hearing—their understandable reluctance to advertise the defect—has at last been overcome. Science and industry have joined hands to produce a new hearing aid that is all but invisible when worn by women, and inconspicuous on men.

The Maico Co., Inc., of Minneapolis, whose audiometer is the instrument most generally used for hearing tests, manufactures the new device, the Secreteer (secret ear). It is a tiny ear mold with a flesh-colored plastic rim, hand made and fitted for individual wearers. It makes the old style "button-in-the-ear" as unnecessary as it is conspicuous. Unlike other hearing aids the receiver of the Secreteer is not worn in the ear but hidden in the hair of women wearers. The hair need not be combed over the ear to conceal the device. Men conceal it under the collar. A slender, transparent, lucite tube conducts the sound from the receiver to the ear. This tube replaces the conspicuous wires attached to other instruments. Because of the space between the ear and collar the device cannot be as effectively concealed by men as by women. Nevertheless it is acclaimed as

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JOURNAL-LANCET extends an invitation to the profession for articles with the understanding that they are original contributions not previously published.

Manuscripts are to be typed on one side of the paper with double spacing. Illustrations must be in the form of glossy prints or drawings in black ink. Please do not attach legends to the pictures. A reasonable number (two or three) illustrations are published free of cost; special arrangements must be made for excess or highly finished illustrations or tables.

Bibliographic references should be at the end of the manuscript and not in footnotes. Each reference should include the following information in the order indicated: Name of author with initials; title of article; name of periodical; volume, page and year. Reprints are prepared on order.

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The JOURNAL LANCET

Minneapolis, Minnesota
February, 1948

Vol. LXVIII, No. 2
New Series

Cardiac Emergencies and Their Treatment

Moses Barron, M.D.
Minneapolis, Minnesota

Heart disease has become one of the commonest ailments requiring medical attention. In its pathogenesis from a large variety of causes and during its course, which is usually greatly prolonged, acute upsets may arise which merit serious attention. These upsets are noteworthy not only because of the dramatic symptoms which make patients desperately alarmed, apprehensive and panicky, but more so because these spells may seriously affect the course of the disease and even threaten the life of the patient. Such attacks constitute cardiac emergencies which may call for quick decision and immediate measures for relief. Though today such emergencies are relatively rare due to the progress that has been made in the management of cardiac patients, nevertheless every physician is called upon at some time or other to attend cardiac patients in such acute episodes which may be truly serious, or, on the other hand, may be merely considered so by the patient or his relatives. When true emergencies exist, the prompt application of appropriate measures may often prove life-saving.

Let us consider first the matter of proper equipment for the doctor's handbag, with the necessary drugs and paraphernalia that every occasion may demand. For this, it may be well to list the supplies commonly in use in cardiac emergencies:

Morphine sulphate, vial sterile solution. 1 cc.=Gr. 1/4
Dilaudid Gr. 1/12
Pantopon Gr. 1/3
Nitroglycerine Gr. 1/100 (H)
Atropine sulphate Gr. 1/100
Adrenalin 5 cc. vial 1:1000
Quinidine sulphate, three grain capsules
Caffein sodium benzoate (H) tablets
Ampoules: Cedilanid 2 cc.—0.2 mgm.
    Mercuhydrin 2 cc.
    50 per cent glucose 50 cc.
    Mecholyl 25 mgm.
    Coramine 2 cc.
    Metrazol 1 cc.—0.1 Gm.
    Aminophyllin 20 cc.—7½ Gr.
Sterile syringe 1 cc. in 1:100
Sterile syringe 3 cc.
Sterile sponges
Cotton
Alcohol
Sphygmomanometer
Tourniquets

SYMPTOMS

Before considering the treatment of the various attacks which cause the patients to demand immediate medical attention, let us describe briefly the main symptoms which prove so alarming to the patient because of the suddenness of the onset as well as the suddenness of the accentuation. These symptoms are chest pains, dyspnea, palpitation, faintness and syncope.

Chest pains. The main cause of cardiac pain is the narrowing of the coronary lumens due to arteriosclerosis, thrombosis, or syphilitic aortitis which may narrow the ostia of the coronaries. Functional spasm which is now considered to be a prominent factor in angina pectoris must also be included. Myocardial anoxemia resulting from myocardial ischemia due to an insufficient blood supply is probably the basic factor of anginal pain. Dr. Fishberg [3] puts it very aptly: "Angina pectoris is the cry

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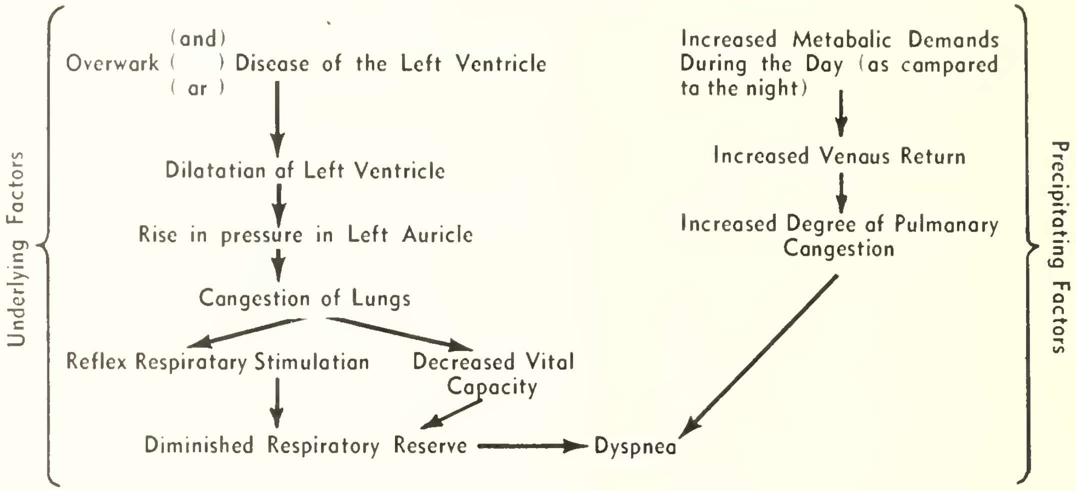
Read before the North Dakota State Medical Association meeting at Fargo, North Dakota, May 27, 1947.

Chart I

The Mechanism of Evening Dyspnea


Underlying Factors
(and)
Overwork ( ) Disease of the Left Ventricle
(or)
Dilatation of Left Ventricle
Rise in pressure in Left Auricle
Congestion of Lungs
Reflex Respiratory Stimulation
Decreased Vital Capacity
Diminished Respiratory Reserve
Dyspnea
Increased Metabolic Demands During the Day (as compared to the night)
Increased Venous Return
Increased Degree of Pulmonary Congestion
Precipitating Factors

From T. R. Harrison: Failure of the Circulation, p. 248.

of the heart for more oxygen." Pain may also occur in severe aortic valvular disease. In rare cases, the sudden alteration of rhythm, as in paroxysmal tachycardia or auricular fibrillation, may cause anginal pain, simulating coronary thrombosis. Similarly, acute chest pains may be encountered in cases of sudden acute pericarditis and dissecting aneurysm.

Dyspnea. "This is the symptom par excellence of a failing heart."[3] Three varieties of dyspnea may be considered resulting from circulatory failure: (1) exertional dyspnea, a condition brought on when the work of the heart is increased by physical exertion or emotional strain at a time when the blood supply to the heart muscle proves inadequate (see Chart I); (2) cardiac asthma or paroxysmal dyspnea or nocturnal dyspnea—conditions which arise in cases of advanced heart disease. These attacks which usually occur at night may progress to orthopnea. The lungs often quickly fill with rales and edema. (3) Periodic dyspnea or Cheyne-Stokes respiration. In advanced stages of heart disease the respiratory center may become affected by reduced cerebral circulation because of arteriosclerosis of the vessels combined with a declining cardiac reserve.

Palpitation. Consciousness of heart action is usually a complaint of minimal importance since it is so commonly experienced by sufferers of cardioneurosis. However, it may be important as it may signify the onset of abnormal rhythms such as paroxysmal tachycardia or fibrillation. The commonest abnormal rhythms which may cause such palpitations are auricular fibrillation, auricular flutter and paroxysmal auricular or nodal tachycardias.

Syncope. Faintness and syncope and occasional vertigo may be associated with some forms of heart disease. Cerebral anemia of greater or lesser degree may be the basis of these attacks. The commonest causes are (1) a hypersensitive carotid sinus, (2) paroxysmal tachycardia, (3) Stokes-Adams syndrome, (4) auricular fibrillation, (5) coronary occlusion, (6) congestive heart failure, and (7) aortic valve lesions. The sudden onset of paroxysmal tachycardias may result in partial anoxemia of the brain. A supersensitive carotid sinus may produce faintness and even unconsciousness with convulsions from a reflex mechanism. Cases of aortic stenosis and regurgitation may produce a general peripheral partial anoxemia with resulting syncope. Stokes-Adams syndrome, which is usually associated with heart block—complete auricular-ventricular dissociation—furnishes the basis of syncope from cerebral ischemia, due either to great reduction in the ventricular rate (below twenty beats per minute) or to a temporary cardiac standstill. This cardiac standstill represents that interval during which the ventricular pacemaker takes on its function of automaticity.

The aforementioned symptoms comprise the main complaints which cause patients or members of the family to believe that an emergency exists which demands immediate medical attention. Though many times the patient is unduly alarmed, often a true emergency does exist.

CLINICAL EMERGENCIES

Coronary thrombosis. Of all the cardiac emergencies myocardial infarction rates the most frequent (see Chart II). The symptoms and findings of this condition are only too well known. It represents a complication of coronary sclerosis which nearly always precedes

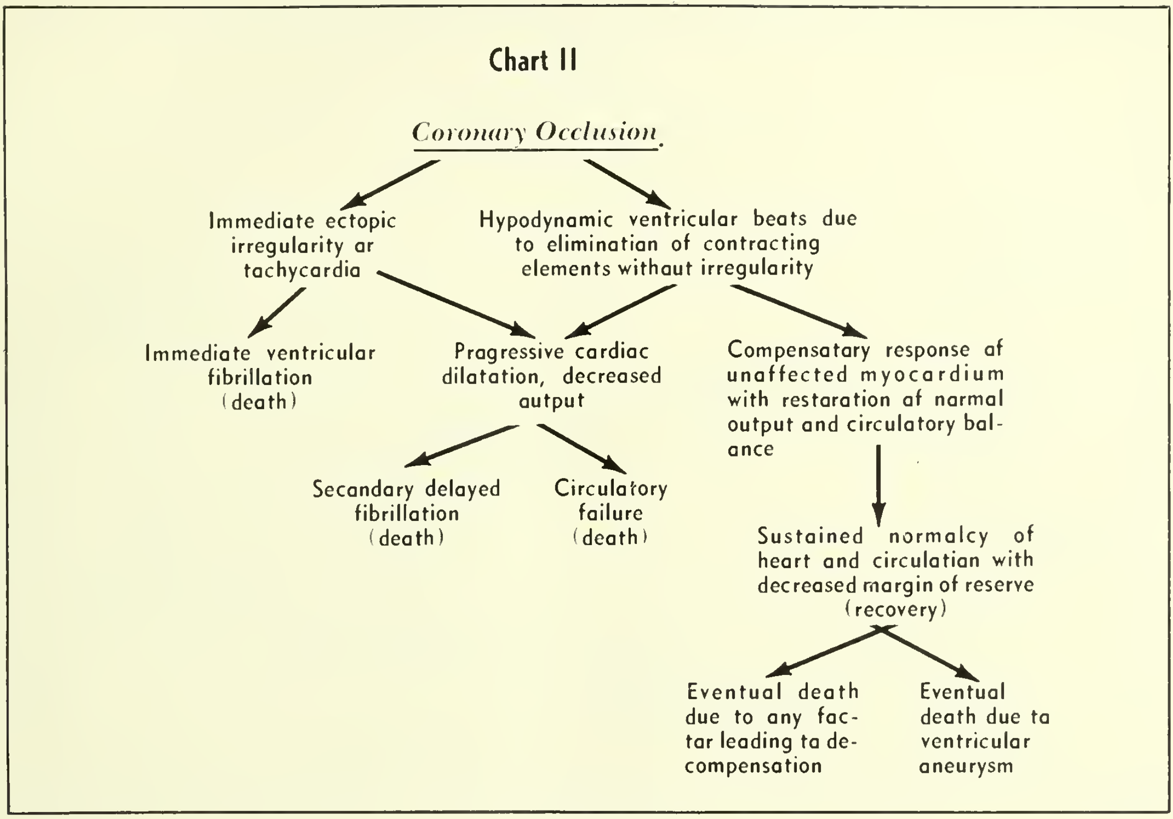


Chart II

Coronary Occlusion
Immediate ectopic irregularity or tachycardia
Hypodynamic ventricular beats due to elimination of contracting elements without irregularity
Immediate ventricular fibrillation (death)
Progressive cardiac dilatation, decreased output
Compensatory response of unaffected myocardium with restoration of normal output and circulatory balance
Secondary delayed fibrillation (death)
Circulatory failure (death)
Sustained normalcy of heart and circulation with decreased margin of reserve (recovery)
Eventual death due to any factor leading to decompensation
Eventual death due to ventricular aneurysm

After Wiggers.

the serious attack of thrombosis by a slow progressive development of several years' duration. The onset is usually sudden. There develops an agonizing, crushing chest pain, often quite unbearable, which may radiate down the left arm and less often down the right one, or both arms, and radiates to regions in the head and back. The pain is usually prolonged, from one-half hour to several days, in contrast to the pains of angina pectoris which are of short duration, usually less than fifteen minutes. As previously mentioned, the pain results from the myocardial ischemia due to the occlusion of a coronary artery or its branches. The management includes the immediate administration of morphine sulphate Gr. 1/4, or of a similar analgesic, hypo or intravenously, for the relief of the pain. This should be repeated in twenty to thirty minutes if the pain continues. Atropine sulphate Gr. 1/100 hypo is of value to remove the constricting vagal effect on the still functionating arteries and arterioles. Papaverine Gr. 1 to 1½ is given subcutaneously or intravenously every four to six hours for its vasodilating effect. Oxygen, when available, should be used for cyanosis or severe dyspnea, or whenever the pain persists in spite of the various analgesics administered. Quinidine sulphate Gr. 3, four times a day, may prevent the development of arrhythmias as well as help to re-establish the normal rhythm when arrhythmias have already developed.

Digitalis should be avoided in coronary thrombosis unless there appear definite evidences of congestive heart failure. This, of course, is only carrying out the general rule that the only true indication for digitalis is congestive heart failure. When used in cases of coronary thrombosis it must be administered with extreme caution, usually in reduced doses, because of the dangers of adding toxicity to the already badly damaged myocardium. Caffein sodium benzoate Gr. 3 to 7½, or coramine 2 cc., may be given hypodermically if the blood pressure begins to drop because of myocardial weakness. Seven and one-half grains of aminophyllin in ampoules of 20 cc., administered slowly intravenously, will often help relieve dyspnea. In severe emergencies, glucose in 50 per cent solution helps to provide food for the distressed myocardium. About 50 cc. should be given intravenously slowly.

The question of using dicumarol for the prevention of both the extension of the thrombotic process and the development of secondary thromboses which may result in embolic phenomena is as yet not settled. The author's opinion is that neither morbidity statistics in relation to embolic prenomena nor mortality statistics have established very conclusively the fact that there is any great advantage in the use of anticoagulants.

Bed rest must, of course, be enforced for from four to six weeks. Restlessness and nervous tension should be reduced through the use of the usual sedatives, nembutal, seconal, phenobarbital and tuinal. Chloral hydrate in doses of 20 to 60 Gr. given in solution by mouth or by rectum is of definite value in some cases because it

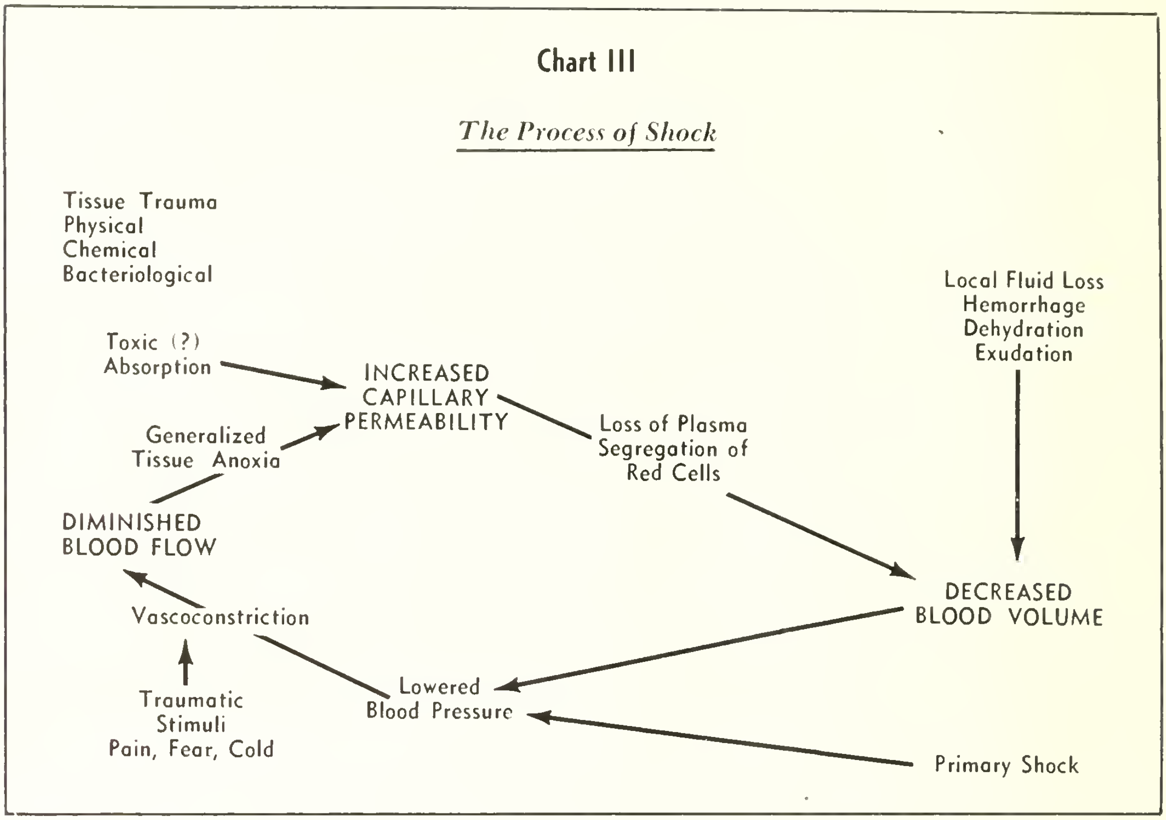


Chart III

The Process of Shock

From P. D. White: Heart Disease, p. 808.

produces relaxation without side effects. Sodium phenobarbital Gr. 3 intramuscularly is used when there is vomiting present. Morphine sulphate Gr. 1/6 hypo should be used in the early stages of treatment every four to six hours to increase the comfort of the patient.

Diet should be light and simple and the fluid restricted to about 1000 or 1200 cc. If congestive failure should develop, the salt intake should be reduced to a minimum. Some of the more severe attacks are accompanied by shock, both from peripheral vascular collapse and from myocardial exhaustion (see Chart III). The treatment for shock would involve the use of intravenous solutions given slowly, blood plasma or transfusions for the peripheral vascular collapse, and the use of caffein, coramine and other cardiac stimulants for the cardiac exhaustion. The usual findings in cases of coronary thrombosis are fever, leucocytosis, a high sedimentation rate, and occasionally the presence of a pericardial friction rub which may appear within one-half hour or not until two weeks after the onset of the attack. The electrocardiogram usually shows significant changes which are characteristic. These changes may be manifested within an hour following the attack or not for a week or two later. Tracings are, therefore, very important for diagnosis but should generally be repeated at intervals over a period of several weeks following an attack.

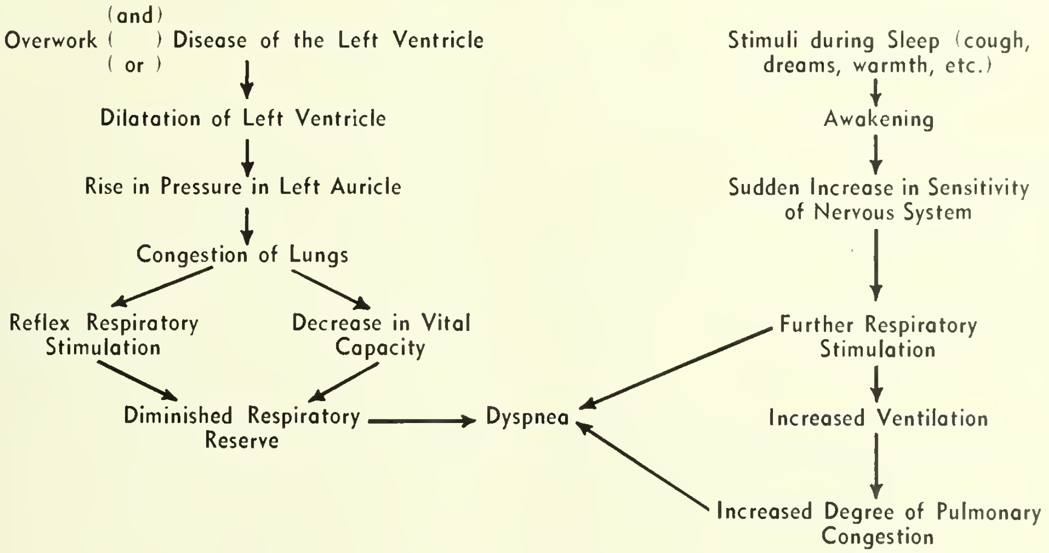
Angina Pectoris. Angina pectoris consists of paroxysmal attacks of a sense of oppression or crowding in the thorax, frequently radiating to the arms, usually brought on by exertion and persisting only a few minutes. It is an evidence of coronary insufficiency. Usually the patient has many such attacks. Occasionally the attack proves fatal, sometimes death occurs during the first attack. The immediate treatment of an attack consists of the administration of hypodermic nitroglycerine tablets Gr. 1/100 placed under the tongue. The absorption is more rapid from the saliva than from the stomach. Amyl nitrate possesses a similar and quicker action but its effect is of very short duration and it possesses undesirable side effects.

The greatest success in therapy is obtained from improved measures of altering the regimen in the life of the patient so as to avoid, as much as possible, severe exertion and mental strain and excitement. The patient must be encouraged in regard to the outlook but at the same time strictly controlled as to habits and activity. The diet should be well balanced, and gluttony of every form must be forbidden. Small amounts of alcohol are allowable and indeed, in many cases, may prove of definite therapeutic value in relaxing the spastic blood vessels as well as the patient. Tobacco should be interdicted but coffee and tea may be allowed in moderate quantities. Tablets of aminophyllin Gr. 1½ to Gr. 3, with or without small doses of phenobarbital, should be administered regularly three or four times a day when anginal attacks tend to recur.

Acute Congestive Heart Failure. Any badly damaged heart may at times develop an attack of acute congestive

Chart IV

The Mechanism of Cardiac Asthma


(and)
Overwork ( ) Disease of the Left Ventricle
(or)
Dilatation of Left Ventricle
Rise in Pressure in Left Auricle
Congestion of Lungs
Reflex Respiratory Stimulation
Decrease in Vital Capacity
Diminished Respiratory Reserve
Dyspnea
Stimuli during Sleep (cough, dreams, warmth, etc.)
Awakening
Sudden Increase in Sensitivity of Nervous System
Further Respiratory Stimulation
Increased Ventilation
Increased Degree of Pulmonary Congestion

From T. R. Harrison: Failure of the Circulation, p. 276.

heart failure without any apparent cause. There may suddenly appear extreme dyspnea, orthopnea, chest pain, cyanosis and an enlarged, painful liver. Apparently the cardiac muscles reach a stage of exhaustion when backward pressure develops and passive congestion ensues. The jugulars become distended and overfilled.

The onset may be very sudden and the patient realizes that he is desperately ill. The treatment should begin with morphine sulphate Gr. 1/4 to 1/2 given for the relief of pain and restlessness as well as for the depression of the respiratory center and the lessening of the dyspnea. Oxygen should be used whenever available. Digitalis properly administered may prove life saving. Cedilanid or other similar water soluble active principles of digitalis may be given in 6 to 8 cc. doses intravenously for the prompt effect. Another dose of 4 to 6 cc. may be given six hours later. The subsequent doses may be administered orally with one, two or three 0.2 milligram tablets of crystodigin or similar compounds daily. The average maintenance dose is one tablet daily. If the patient has had previous digitalis medication the digitalizing doses should be correspondingly reduced. Venesection occasionally offers great relief to the overburdened heart. From 300 to 600 cc. of blood should be removed.

Diuretics are of great value to relieve excess of fluid in the body, especially of the lungs. Mercuhydrin or similar mercurial diuretics are most effective for this purpose, generally administered intravenously in courses of four injections given every other day. I slowly increase the dosage, starting with 1 cc., then 1½ cc., and the last two doses being 2 cc. each. A daily dose of 75 to 90 grains of either ammonium chloride or potassium nitrate increases the diuretic effect. When using these diuretics, paracentesis of either chest or abdomen is rarely necessary. In some of the extreme cases of heart failure, tourniquets on each of the extremities at a tension of about 50 mm. of mercury will often relieve the heart's burden by holding back large quantities of blood in the extremities from returning to the overloaded heart. These should not be left on for more than 15 or 20 minutes at a time. The other factors in the treatment are proper bed rest, good nursing care, salt-free diet, with a moderate restriction in fluids.

Paroxysmal Dyspnea. Paroxysmal dyspnea or cardiac asthma presents one of the more dramatic types of cardiac emergencies. The symptoms closely resemble an acute attack of severe asthma but the patient experiences a much greater sense of suffocation. The patient often will thrust his head through an open window in an effort to get more air. An attack may last from several minutes to several hours. Coarse and bubbling rales soon appear during the attacks and the patient sometimes expectorates frothy blood-tinged sputum. The attack is ushered in by a failing left ventricle which at the moment is unable to carry off the quantities of blood brought to the lungs by the more normally functioning right ventricle. These attacks occur most often at night since the recumbent position in bed favors the return flow of the blood from the body into the right heart and thence to the lungs (see Chart IV).

The drug that is almost specific for this dramatic episode is morphine. This should be given at once in Gr. 1/4 doses to be repeated if necessary in 15 to 20 minutes. The morphine depresses the sensitive respiratory center and at the same time the patient becomes less apprehensive. Aminophyllin, given in doses of Gr. 3¾ to 7½ intravenously, is also of value. Oxygen when available helps give relief. Some patients die during the attack. Some cases respond well to mercurial diuretics as a preventive measure for lessening the frequency of the attacks. In addition to the diuretics, rest, digitalis and restricted salt intake are of value.

Pulmonary Embolism. Pulmonary embolisms may give symptoms similar to coronary thrombosis but the condition is really a complication of disturbances in circulation and should not be included any more than cerebral embolisms among the cardiac emergencies.

Disturbances of Rhythm. One of the common arrhythmias that occasionally cause great apprehension to the patient is the sudden onset of an attack of paroxysmal auricular tachycardia. The pulse suddenly becomes very rapid, from 160 to 200 beats a minute, but the rhythm remains regular. If organic heart disease is present, such a rapid rate may precipitate an attack of heart failure. The treatment consists of attempting to establish the sinus rhythm by pressure on the carotid sinus or pressure over the eyeballs or by inducing vomiting. Some patients develop schemes of their own which help them to eliminate distressing arrhythmias. Syrup of ipecac in doses of 10 to 30 cc. will induce vomiting and will often stop the abnormal rhythm. Mecholyl in 20 mgm. doses given subcutaneously will, in most instances, stop the disturbing tachycardia. When administering mecholyl, however, another syringe containing 1/60 Gr. of atropine should be kept ready to be used if any toxic symptoms from the mecholyl should occur.

Paroxysmal ventricular tachycardia. This arrhythmia is a complication usually indicative of serious organic heart disease. The exact diagnosis can be established only by the electrocardiogram. The patient should be given sedatives in order to eliminate the restlessness and apprehension. Morphine sulphate Gr. 1/6 is valuable for this. Quinidine sulphate in doses of three grains given every hour for five or six doses will sometimes terminate the attack. Larger doses may have to be used but one must be cautious to avoid toxic effects. In extreme cases quinine-dihydrochloride 0.5 Gm. may be given intravenously but only when other methods have failed. It must be administered very carefully and slowly to avoid serious accidents.

Auricular flutter. This arrhythmia also can be definitely diagnosed only by means of the electrocardiogram. The treatment is first to administer large doses of digitalis. Cedilanid in doses of 0.8 mgm. may be given intravenously, repeated with 0.4 mgm. four to six hours later. Quinidine may then be used to convert the auricular fibrillation, which usually results from the digitalis, into the normal sinus rhythm. If advanced heart disease is present, a maintenance dose of digitalis should be continued.

Auricular fibrillation. This arrhythmia is included in cardiac emergencies since occasionally the patient becomes greatly distressed and apprehensive because of the very irregular palpitating heart. The treatment consists of first slowing the rapid, irregular heart by proper digitalization and then attempting to establish the normal rhythm by the administration of appropriate doses of quinidine sulphate.

Syncope. One of the important causes of syncope in heart disease is the Adams-Stokes syndrome. There may develop a loss of consciousness either from cardiac standstill or from too slow a pulse rate. When the pause exceeds eight seconds, unconsciousness supervenes, occasionally accompanied by convulsions. Sometimes the spells recur frequently. The treatment is not very satisfactory. It consists of administering epinephrin hypodermically in 0.5 cc. doses of a 1:1000 solution repeated in an hour or two. For more lasting effects, epinephrin in oil, 1 cc. of 1:500 solution, may be given. Ephedrin in doses of 3/8 to 3/4 Gr. four times a day sometimes reduces the frequency of the attacks. When a cardiac standstill is too prolonged, 0.5 cc. of epinephrin should be injected directly into the heart muscle.

Cardiac Tamponade. This condition arises from a sudden accumulation of fluid within the pericardial sac. There are a number of causes for this condition. The cardiac embarrassment is the result of pressure on the great veins entering the heart, thus obstructing the inflow of blood and at the same time the increased intrapericardial pressure preventing the heart from fully dilating during diastole. Hemopericardium may arise from stab wounds, a ruptured aneurysm or from a ruptured myocardium which resulted from myomalacia cordis, an occasional end-result of coronary thrombosis. Of these conditions, few respond to treatment. There is one type of tamponade that is more amenable than others. I refer to that produced by severe acute pericarditis with effusion. When the effusion causes marked increase in intrapericardial pressure, the situation becomes an emergency in which prompt treatment may be life-saving. The specific treatment consists of immediate aspiration of the accumulated fluid according to recognized technic. Stab wounds may sometimes be successfully treated by aspiration and suture.

Cardiac standstill. This condition is of importance principally when it occurs during operative anesthesia. Action must be immediate. The prompt injection of adrenalin, 1/2 to 1 cc. of 1:1000 solution directly into the heart muscle, is imperative. It has been suggested that the injection into the right auricle is more effective. If the heart fails to respond, direct massage through an incision of the first and second left costal cartileges should be attempted to establish the cardiac contractions.

Sudden Death. Since cardiac emergencies often end fatally in spite of treatment or because prompt treatment could not be instituted, it may be of interest to consider the more common causes of sudden death in cardiac patients. Morgan[9] stated that the commonest cause of sudden death is coronary disease. This may occur from coronary thrombosis, angina pectoris, or simple coronary insufficiency. About one-half to one per cent of coronary deaths are due to myocardial rupture and tamponade. He also states that about 10 per cent of coronary thromboses end in myocardial rupture and hemopericardium. This, I think, is not the experience of a large number of observers. In my own experience and in a review of autopsy material, cardiac tamponade from myocardial infarction seems to constitute a smaller percentage of deaths following coronary thrombosis. Clawson and Bell[9] found that 20 per cent of the cases of syphilitic aortitis died suddenly, though usually, in these cases, death is preceded by congestive heart failure. Aortic stenosis and regurgitation are responsible for only a small percent of sudden deaths. It is stated that 20 per cent of traumatic non-penetrating injuries to the heart also terminate in sudden death. The principal predisposing organic cardiac lesions which terminate in sudden death are given as follows:

1. Coronary sclerosis, (1) angina pectoris, (2) coronary insufficiency
2. Coronary occlusion
3. Mesoaortitis luetica
4. Acute myocarditis or toxic myocardium, (1) diphtheria, (2) other acute infections
5. Certain arrhythmias.

The actual physical causes of sudden death are ventricular fibrillation and cardiac standstill. About one-third of all cases of coronary occlusion, recent and old, die suddenly. Contrary to the general belief of the layman, only 4 per cent of all deaths from heart disease occur suddenly.

CONCLUSIONS

1. Acute upsets occasionally arise in cases of heart disease which demand immediate attention.

2. It is necessary that practicing physicians become acquainted with the symptoms of these upsets and their treatment in order to avoid more serious consequences.

3. A list has been given of the drugs and paraphernalia necessary for ready application of the proper therapeutic measures in each case.

4. A more general discussion of the symptoms and findings in various types of emergencies has been presented. Several charts have been included to help explain the mechanism through which some of the more complicated symptom-complexes develop. A better understanding of the pathogenesis, symptomatology and therapy of certain cardiac emergencies is necessary to insure prompt treatment and to add to the mental and physical comfort of the patient.

NOTE. Since the completion of this paper, an article has appeared in the *Proceedings of the Staff Meeting of the Mayo Clinic* of May 14, 1947, in which Parker and Barker conclude that dicumarol alone or in combination with heparin showed a lowering of the secondary thromboembolic complications from 37 per cent, as had been reported by Nay and Barnes, to 4 per cent. They believe that their results warrant the use of the anticoagulants in cases of acute coronary thrombosis.

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PASS 12 MILLION GOAL!

The American Cancer Society closed its 1947 campaign in a blaze of glory, exceeding its 12-million-dollar goal in the first major drive ever to go over the top. Western states dominated the high percentage divisions. The "big seven," rated in the order named were: Idaho, Montana, North Dakota, Arizona, Wyoming, Kansas and Delaware. The first issue of the Kansas Cancer Bulletin, December, 1947, gives these interesting figures:

1947 CONTRIBUTIONS REPORT

State	Goal 1947	Cash & Pledges 1947	Pct. of Goal To Date
Idaho	$ 35,000.00	$ 76,518.50	218.2
Montana	40,000.00	84,000.00	210.0
North Dakota	40,000.00	82,000.00	205.0
Arizona	27,840.00	45,511.25	163.4
Wyoming	17,000.00	27,253.43	160.0
Kansas	109,920.00	172,230.00	156.6
Delaware	40,800.00	62,241.56	152.5

Report of an Influenza Type A Epidemic

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Columbia, Missouri

Its effect on a university student body, sign and symptomatology analysis of 440 cases, the effectiveness of influenza vaccination amongst the student body, type of planning and organization best calculated to handle epidemics in institutions such as student health services, state hospitals, and eleemosynary institutions in general.

* * * *

THE influenza pandemics that followed World War I left such a horrendous impression in the minds of all medical and lay people, that the months and years immediately following World War II have been anxiously scanned for the least evidence of any recurrences of similar catastrophes.

HISTORY OF THE 1947 EPIDEMIC

In January 1947 it was becoming evident from press reports that some type of mild influenza-like respiratory disease was occurring in local epidemic form in various localities in the midwestern and southwestern United States. The first report noted was of an outbreak at a military air base about 750 miles west of this locality. The next report noted was of an outbreak several weeks later at a military air base 150 miles east of this locality.

About February 10, 1947 we became aware of the fact that the great majority of the upper respiratory cases being admitted to the communicable disease section of the Student Health Service of the University of Missouri presented a clinical picture simulating mild influ-

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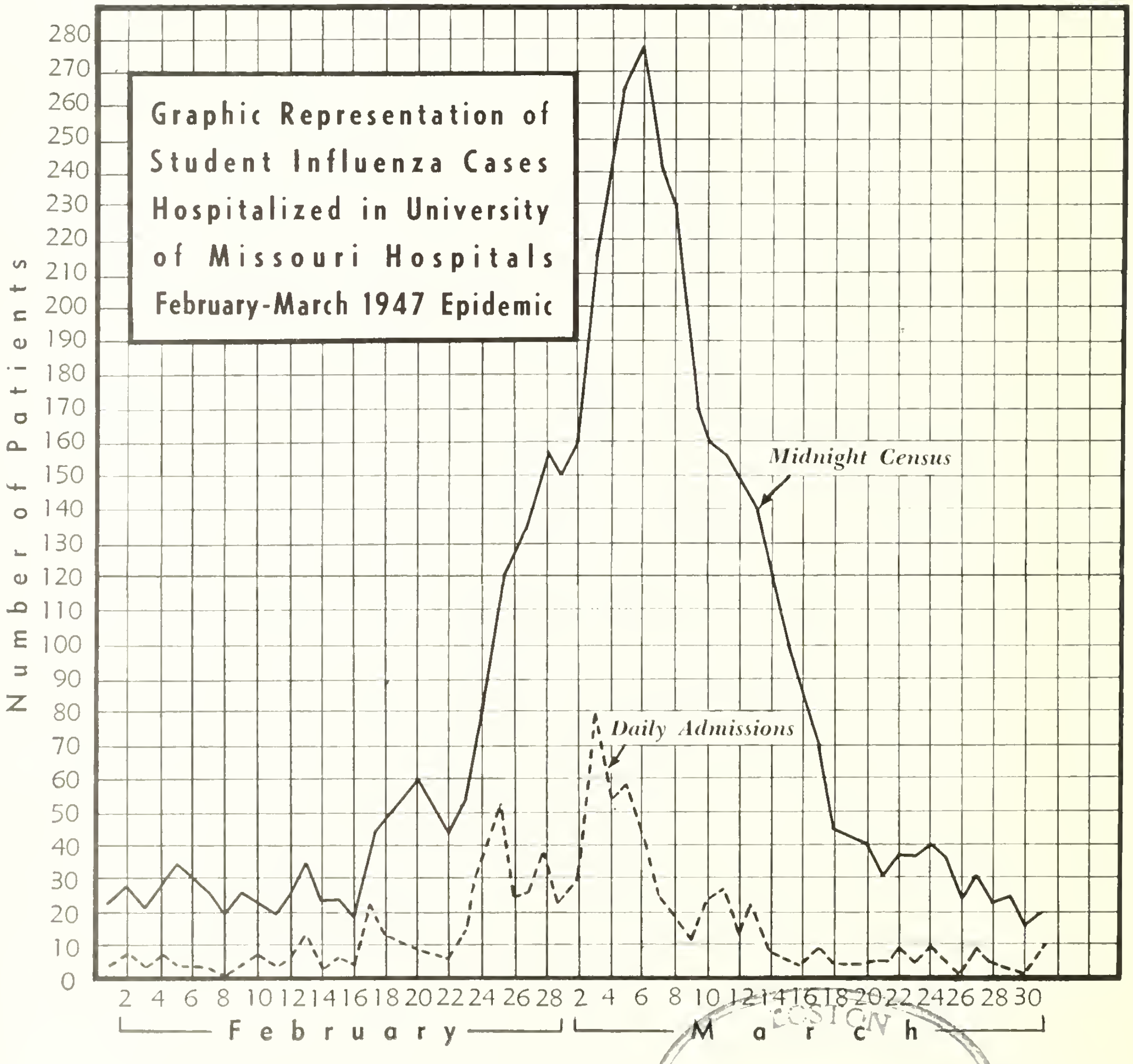
*From the Student Health Service, University of Missouri, and the Department of Medicine, University of Missouri School of Medicine.



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enza. On February 17, 1947 we were aware of the fact that we were dealing with an epidemic and from that time on the daily admission rate began to increase steadily, as did, of course, our midnight census figures, which, from a usual figure of 25-30 student upper respiratory patients, attained eventually a peak level of 277 influenza patients (see chart). It should be borne in mind that the Student Health Service of the University of Missouri provides complete free hospitalization to all students registered for a full course of studies, for any acute illness that may arise during his stay at school.

It is interesting to note the relatively high daily admissions occurring on Mondays, which is characteristic of Student Health Clinic admissions in general. We attribute this to the fact that, the student is prone to take full advantage of his weekend for visits home and the like, and so tends to delay seeking advice or aid for his ills until his weekend is over.

The epidemic lasted about six weeks in all, during which time about 880 cases of this upper respiratory disease were admitted.

We have been advised that military epidemiologists investigating the influenza outbreaks suggested that the responsible virus was brought to this country via San Francisco from Korea by prisoners of war and thence through two or three air fields across the country to the midwestern states.[2]

Clinical Picture and Chart Analysis

Serological studies were conducted on a small number of typical acute cases and 440 charts were selected at random for analysis and study.

Before entering into a detailed discussion of the clinical features of the influenza epidemic insofar as it involved the students of the University of Missouri (numerous cases were reported as well amongst the local townspeople but no accumulated data is available concerning these cases) it would be wise to make a few pertinent remarks concerning terminology.

Upper respiratory diseases in general exhibit all manner of combinations of signs and symptoms referable to the upper respiratory system that are never too characteristic for any one respiratory disease, and in numerous cases the etiology cannot be too clearly established. As a result, attempts at nomenclature, classification and specific and detailed diagnoses have often been confusing and uncertain. As pointed out by Reimann,[3] little progress in classification may be expected until exact etiologic diagnoses are possible.

In our capacity as Physician in the Student Health Service attending General Medicine and Communicable Diseases, under the direction of Dr. D. G. Stine, Professor of Medicine, University of Missouri School of Medicine, we have come in contact with all cases of upper respiratory infections arising in a student body of 10,000 to 11,000 and requiring hospitalization. Our criteria for hospitalization have been usually a minimal temperature elevation of 1 to 2 degrees Fahrenheit, and/or malaise of such a degree that the student had no desire to go to classes (and with our many serious-minded and earnest veteran students this degree of malaise was often quite high).

Our system of classification of acute upper respiratory diseases has followed the pattern, generally speaking, laid down by Reimann.[3] We look upon influenza as a definite clinical entity caused by the influenza virus. In all the cases diagnosed clinically as influenza that were selected for serological investigation, the diagnosis was confirmed by the studies.

In the typical case diagnosed clinically as influenza, the onset was abrupt with fever, headache, malaise, cough and aching. The fever on admission varied from just above normal to 104° F.; the headache was low frontal or retro-orbital, sometimes described as "aching eyeballs" and varying in intensity from mild to severe; the malaise varied in degree from very slight to marked discomfort and prostration; the cough was usually hacking, persistent or spasmodic and usually nonproductive; the aching was either generalized body aching or localized to the lumbo-thoracic back region, and/or leg muscles. In smaller proportions of the cases, there were complaints of sore throat, chills and "stuffy" or running nose (tabulated as rhinitis; see Table 1). For comparison we have included the tabulation by Stuart-Harris of 88 cases of influenza A in 1938.[3]

Table 1

Percentage of Symptoms and Signs in Influenza A

	University of Missouri Series	Stuart-Harris
Date	1947	1938
Number of cases	440	84
Fever	98.5%	all?
Headache	71%	87%
Malaise	59%	91%
Cough	58%	71%
Aching	53%	51%
Sore throat	37%	43%
*Chills	21%	74%
Rhinitis	20%	——
Chest discomfort	6.1%	24%
Nausea and/or vomiting	4.3%	11%?
Diarrhea	1.1%	31%?

*Note: "Chilly sensations" as distinct from "shaking chills" not included in University of Missouri figure.

Physical examination of uncomplicated cases was negative essentially except for fever and, in many instances, a beefy-red hyperaemic pharynx with numbers of dilated venioles.

A Minnesota study,[4] in 1946, of such throats observed in an influenza A epidemic demonstrated that a predominantly mononuclear exudate was usually found in the pharyngeal smears. The authors believe that study of pharyngeal smears may be helpful in the differential diagnosis of bacterial, fungous and virus diseases of the throat.

In uncomplicated cases the patient became symptom-free within two to three days and afebrile usually within two to four days following admission (see Table 2).

TABLE 2
Duration of Fever in Uncomplicated Cases of Influenza A

Duration (days)		Percent of Cases
Fever lasted 1 day	in	12.8% of cases with fever
2 days	in	27.6%
3 days	in	34.2%
4 days	in	13.8%
5 days	in	5.7%
More than 5 days	in	5.9%

Blood studies showed characteristically a normal to low white cell count with a normal to increased lymphocyte count.

TREATMENT

By and large the treatment regime used consisted of bed rest, forced fluids and analgesics for discomfort such as generalized aching and headache. Cough medicine and nose drops were administered in those instances where the patient particularly desired these medications. The use of salicylates for antipyresis was discouraged.

Our policy was very definite in avoiding chemotherapy and the use of antibiotics except in those instances where we began to suspect secondary bacterial invasion superimposed upon the original viral infection. A 1946 study has shown[5] what many of us have already suspected, that chemotherapy (and, of course, the use of the antibiotic agents) will prove valuable in reducing the case fatality rate in influenza epidemics because of the effective treatment of the secondary bacterial infection, which factor primarily was responsible for many of the deaths in the great pandemics following World War I.

Table 3 lists all the complications encountered in the 880 influenza cases hospitalized during the February-March epidemic.

TABLE 3

Complications	Number of Cases
Lobular pneumonitis	18
Bronchitis	16
Acute pleurisy	3
Pleurisy with effusion	1
Exudative pharyngitis	2
Otitis media	2
Laryngitis	1
Ganglionitis herpes (manifested by involvement of right ear)	1

In addition, there were 16 instances of recurrence of influenza that required hospitalization for a second time.

SEROLOGICAL STUDIES

These studies were made for us by the Eli Lilly Laboratories of Indianapolis, Indiana. The cases selected for investigation were of patients who on admission presented the typical clinical syndrome. All of the cases selected for serological study on the basis of their manifesting a typical clinical syndrome turned out to have typical blood counts.

Two sera were drawn from each patient, the first in the acute stage of the disease, which in all cases was on the day of admission; the second serum was drawn a fortnight later. None of the cases used had had influenza virus vaccine. The sera of five patients in all were tested and each showed an increase in titre against the Weiss A and PR8A virus strains, with very little to no increase against the Lee B strain.

The conclusion was that we were dealing probably with an epidemic due to influenza virus type A.[2]

It should be noted at this point that recent discussions by epidemiologists and bacteriologists concerning the February-March 1947 epidemic relating particularly to the fact that individuals who had received what was considered adequate immunization with influenza virus vaccine, types A and B, had not been as well protected as expected from the antibody titres they possessed, supported the belief that a new strain of influenza virus type A which differed immunologically from previous types may have been involved. The National Institute of Health of the United States Public Health Service has advised that this newly detected variant be included in commercial vaccine preparations.

It is the belief of some public health consultants that a sufficient reservoir of the new virus has been established to allow the prediction of epidemics due to it. Other authorities believe that the long predicted epidemic of A virus will appear.[6]

EFFECTIVENESS OF VACCINATION

A perusal of some of the literature on this subject suggests that vaccination gives considerable protection against influenza.

One study reported an incidence of 2.2 per cent influenza cases, types A and B, in a group vaccinated with a combined A and B vaccine, as compared with 7.1 per cent in a nonvaccinated group.[7]

Another study reported an incidence of 1.15 per cent influenza in a group immunized with a combined A and B vaccine as compared with 9.9 per cent in a nonvaccinated group.[8] The epidemic prevalent at the time was type B.

A third study reported attack rates of 0.5 per cent and 12.5 per cent in vaccinated and nonvaccinated groups respectively in an epidemic of influenza B.[9]

It has been pointed out that immunity begins about eight days after vaccination and may last up to four months against type B, but not more than four weeks against type A.[10] This may account for the apparent greater effectiveness of vaccine against influenza B than against influenza A.

In addition, one should conclude from the aforementioned that vaccination really to be effective should be done at least eight days before exposure, and should be renewed at monthly intervals, at least throughout an epidemic. Our own statistics to demonstrate the effectiveness of the combined A and B vaccine given to University of Missouri students do not provide evidence as conclusive as do studies involving the use of controlled vaccinated and nonvaccinated groups.

Military studies have been able to produce valid statistics on controlled vaccinated and nonvaccinated group influenza attack rates. Because we do not have such absolute control among our students, and cannot insist on their being hospitalized in our Student Health Service, we thus are not aware of all cases of illness incident amongst the student body. Influenza vaccinations were not compulsory, being accepted purely on a voluntary basis on the part of the recipient. Moreover, we know, as pointed out above, that we did not hospitalize nor see in our outpatient department (and so have no record of) all the cases of influenza that occurred amongst our students. Another factor to be taken into consideration is the fact that about 50 per cent (1,670) of the vaccinations were given during the first few days of the epidemic, when students, alarmed by the proportions of the epidemic, became more eager to accept vaccination, i.e., many of the vaccinations were done when the recipients had already been exposed to the virus. Keeping these limitations in mind, we can then weigh more properly the evidence presented by the following statistics:

Of the 440 charts analysed, notations had been made on 283 as to whether the patient had been vaccinated against influenza or not. Of these 283, 71 per cent had not been vaccinated against influenza.

Of the 29 per cent who had received the vaccine: 3.5 per cent had been vaccinated within the 48 hours preceding admission; 3.5 per cent had been vaccinated 3-7 days prior to admission; 4.6 per cent had been vaccinated 8-13 days prior to admission; 12.8 per cent had been vaccinated 2-8 weeks prior to admission.

Another factor to be borne in mind in interpreting these figures is the possibility of diagnosing erroneously vaccination reactions as influenza and vice versa, particularly in those instances where the illness happened to occur within 12-24 hours of the vaccination.

In an effort to reduplicate the evidence presented by influenza incidence figures in controlled vaccinated and nonvaccinated groups, the writer undertook to poll at random various students encountered throughout the University campus and surroundings. Included in the survey were members of two fraternities and of two sororities. Opinions were noted only of those students who had been in the University during the epidemic. Care was taken to ascertain that the student understood what was meant by influenza. Those cases only were acceptable that occurred in February, March or April 1947.

In all, 878 students were polled. Of these, 405 (46.4 per cent) stated that they had been vaccinated against influenza in the Student Clinic. This figure does not compare favorably with the official figure of 3,595 clinic administered influenza vaccinations, which out of a student body of 10,500 amounts to 34.2 per cent. Possible causes for the discrepancy: (1) Confusion of influenza vaccination with smallpox vaccination which is compulsory for every student. (2) Some of the students may have answered untruthfully in the affirmative, in the fear that if they had not been vaccinated they would have to undergo vaccination.

Of the 405 students who stated they had received influenza vaccination, 9.1 per cent stated they had influenza within the February-April 1947 period following vaccination. Of the 473 students not vaccinated, 17.9 per cent had influenza within the same period.

Faulty as these figures may be, due to errors in statistical technic, the weight of the evidence seems definitely to favor the efficacy of the vaccine against influenza given to our students during the 1946-47 school year.

Before terminating the subject of vaccination we should like to emphasize the fact that no student with a history of asthma, hay fever, allergy or sensitivity to egg protein or chicken feathers was permitted to be vaccinated. Reports of profound and fatal anaphylaxis resulting from the use of influenza vaccine in untested patients have strengthened our resolve in this direction.[11] It has recently been pointed out that of the various vaccines available, the most highly purified vaccine, namely, the centrifuge type, should be used whenever possible, because the reaction produced by this type in an egg-sensitive person is far less than that produced by the eluate type of influenza vaccine.[12]

Planning and Organization Suggestions

Early appreciation of the developing epidemic, prompt vaccination of all personnel concerned and properly prepared plans for the allocation of beds for stricken patients and of medical personnel to care for them will go far to helping secure a well-organized setup for the handling of the epidemic.

In our epidemic our bed allocation was just one jump ahead of the immediate need for bed space, i.e., the beds were provided only when the urgent necessity for them arose. The result was that soon we were overcrowding, which of course has very dangerous potentialities because not only does this tend to whip up the virulence of the influenza virus but it also facilitates the spread of the secondary bacterial invaders once they get a foothold.

Early appreciation of the developing epidemic will be secured where medical and communicable disease services are attended by physicians who can devote as much of their time as possible to these services, who are aware of all cases as soon as possible after admission, and who remain in intimate contact with their patients. Obviously, under these circumstances, adequate and proper treatment will also be ensured for the patients.

Where a shortage of medical personnel develops, it may be necessary to set up treatment routines to expedite the initial care of the patient. However, at no time should the management and observation of these patients be neglected to the extent that complications develop and remain undetected for hours.

As far as the bed allotment is concerned, this should be done at the very beginning of the epidemic, the total number of beds expected to be used being allocated and set up from the start. It is, of course, difficult to predict with even a fair degree of accuracy the number of beds that may be needed, for the morbidity rate will vary from epidemic to epidemic. Beds to the number of 5 to 10 per cent of the group for whose care the institution is responsible should suffice at the onset. Thus a definite number of beds should be set up in advance in definite locations, so many for male surgery, so many for female surgery, so many for male clean medicine, so many for female clean medicine, so many for non-influenzal upper respiratory cases male, so many for non-influenzal upper respiratory cases female, so many for male influenza, so many for female influenza, and so on. Additional provisions might be made for special rooms for very acutely ill patients, and for cases not immediately diagnosed to be kept under observation. In allocating bed space one must also bear in mind that most hospital standards require 100 square feet of floor space and 100 cubic feet air space per bed.

All such plans should have been drawn up well in advance of an epidemic and should include the allocation of attending personnel, medical, nursing, and orderly, being specific even so far as naming the personnel involved.

With such plans on hand for immediate use, we believe that hospitals and other institutions could move along in high gear and engage in successful battle with the enemy when O hour I (influenza) day arrives.

SUMMARY AND CONCLUSIONS

1. A report is made of an influenza A epidemic involving a student body of 10,500, of whom 880 cases (8.3 per cent) were hospitalized. 34.2 per cent of the student body had been immunized with combined influenza A and B vaccine. Of the cases hospitalized, 71 per cent stated they had not received influenza vaccine, and 29 per cent stated they had received it.

2. A sign and symptom analysis is made of 440 of these cases and compared with a similar analysis of 88 cases reported in 1938.

3. A report is made on the serological studies done to determine the type virus responsible. It is suggested that a new variant type A virus was responsible and that it may be responsible for a new epidemic in the future.

4. A campus survey of 878 students chosen at random showed an incidence of 9.1 per cent influenza cases reported among students who said they had received influenza vaccination, as compared with an incidence of 17.9 per cent influenza among students who stated they had not been vaccinated. 13.9 per cent of the students surveyed stated that they had influenza during the epidemic, as compared with a hospitalization incidence of 8.3 per cent.

5. Hospitals and other institutions should have on hand, ready for immediate use for epidemics, properly prepared plans for bed and bed space allocation and for the allocation of medical, nursing and orderly personnel.

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HIGHER INFLUENZA RATES REPORTED

Influenza is striking Americans this winter at a rate higher than is normally expected, the United States public health service reported recently, "but there are no indications of a widespread epidemic as yet." Since early August, 53,893 cases have been reported, compared with 36,640 for the corresponding period in 1946-47, a health service statistician said. Most of the cases occurred in southern and southwestern states. In the week ended January 10, there were 10,335 new cases reported over the nation, compared with 7,315 for the preceding week. Texas reported 4,712 new cases for that week, California 1,278, South Carolina 916 and Arizona and Virginia 849 each. California health authorities reported that "mild" influenza, originally noted in Los Angeles, now has spread as far north as San Francisco.

Histamine Antagonists in the Treatment of Allergy

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The symptomatic treatment of certain allergic disorders has received a new impetus within recent years with the discovery of a whole new group of drugs generally referred to as histamine antagonists. The effectiveness of these agents is due to their antihistaminic action. Before entering into this discussion it is well to review the present knowledge of the role of histamine in the production of allergic manifestations.

Role of Histamine in Allergy

Anaphylaxis and certain allergic manifestations are analogous immunologically in many respects. The manifestations of both are due to an antigen-antibody union which irritates the cells of certain tissues, which are referred to as shock tissues. As a result of such irritation there occurs in animals smooth muscle spasm (bronchioles in the guinea pig and media of arterioles in the rabbit); in man there occurs both smooth muscle spasm and dilatation and increased permeability of capillaries. For a long time investigators have tried to find out just what produces this irritation. This question was finally answered by Lewis who concluded that the antigen-antibody union releases in the tissues either histamine or a histamine-like substance and that it is this chemical which produces reversible tissue changes characteristic of anaphylaxis or allergy. He pointed out the similarity between histamine shock and anaphylactic shock, as well as the similarity between the positive skin reactions obtained from the intradermal injection of histamine or of the specific allergen in a sensitive individual.

Histamine has the property of causing contraction of the guinea pig uterine strip and produces a fall in the peripheral blood pressure of the cat. Injected intradermally in man it produces a local change which has been described as the triple response of Lewis. It consists of (1) erythema, (2) flare and (3) whealing. This triple response is identical with that produced on the skin of a dermographic patient by mechanical irritation such as scratching. The administration of histamine in large doses produces profound vasodilatation with loss of circulating fluid and reduction in cardiac output. Histamine apparently acts directly on capillaries without the intervention of the nervous mechanism, dilating these capillaries and producing increased capillary permeability. This effect does not involve equally all the smaller arterioles and capillaries. For example, while the vessels of the face and neck are dilated, those in the extremities are contracted, accounting for the marked difference in the skin temperature of the extremities and that of the face after histamine administration. Salivary, gastric and bronchial mucous glands are stimulated. The blood pressure is lowered. The smooth muscle of the bronchi, intestines and uterus is contracted. Clinically there occurs dizziness, headache, and flushing of the face. Symptoms resembling those of histamine administration may result in patients with allergy to physical agents. These include, as is shown by one of our cold sensitive patients, local whealing on contact with cold followed by flushing of the face, dizziness and lowered blood pressure.

Code improved on an original technic of determining the amount of histamine in the blood of animals in terms of micrograms per cubic centimeter of blood. In this way he demonstrated that the histamine value increased four to eight times in guinea pigs during anaphylactic shock, and two to eighty times during anaphylaxis in dogs. This excess of histamine passes into the plasma from the white cell layer during shock, reaching normal within two to three hours. Normally 90 per cent of the histamine is found in the white cell layer and the balance of 10 per cent in the plasma and red blood cells. The fall in blood pressure observed in dogs during shock is thought to be due to the vasodilating effect of histamine. However, the lowered blood coagulability observed in such dogs can not be caused by histamine. It is probably due to the liberation of both histamine and heparin from the liver due to liver cell damage during anaphylactic shock. Code believes that death in anaphylactic shock in the dog is in reality a histamine death. The cells are damaged as a result of anaphylaxis. Histamine is liberated and if the animal is sufficiently sensitive to histamine, he is poisoned by it.

Experiments in the rabbit are somewhat inconclusive. In one series, a fall in histamine level was found during anaphylaxis in rabbits. Katz incubated the blood of sensitive rabbits with the related antigen *in vitro* and showed a release of blood histamine (two to six times of normal). Other workers showed that there were fluctuations in the histamine blood level of patients with asthma and other allergic conditions. Code showed also that bone marrow contains histamine and points to the possibility that its presence may have something to do with the development of allergic agranulocytosis.

Yoshimura was first to discover histamine in soy beans in 1909. Harger and Dale isolated it from ergot in 1910. Later it was shown to be present in all normal organs particularly in the lungs, the intestinal mucosa, and the liver. Histadine is a precursor of histamine. The latter is derived from the decarboxylation of histadine. Amino acids are carried to the liver where they are deaminized, resulting in the production of urea which later breaks down into histadine and finally into histamine. It would appear that the adrenal plays an important role in combating the effect of histamine, for adrenalectomized rats cannot inactivate histamine which is injected into them. However, if these rats are fed adrenal cortex substance, then the histamine effect may be counteracted. The question may be raised as to whether other mechanisms besides that of antigen-antibody union produce histamine from histidine. Also, why is it that other types of antigen-antibody union do not release histamine?

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In view of this all-important role played by histamine or an H-like substance in the mechanism of allergic manifestations, it is logical that efforts should have been directed for many years towards the discovery of some agent which would combat this histamine-like influence on the tissues. Such an agent would have to possess the property of either (1) destroying histamine chemically, (2) decreasing the susceptibility of the shock tissue to histamine or (3) in some way interfere between the union of antigen and antibody so that this union will not result in histamine liberation and (4) stimulate the sympathetic nervous system.

The following deals with a critical review of the various antihistaminic agents which have been advanced as useful in the treatment of allergic disorders.

Histaminase

Best & McHenry showed in 1930 that extracts of fresh tissues such as the kidney and the intestines contain an enzyme and that this enzyme can destroy histamine in the test tube. It was natural to assume that the introduction of this enzyme (histaminase) into the body of an allergic patient in large quantities might help counteract the effects of histamine. Extensive clinical use of histaminase in various allergic disorders such as urticaria, hay fever, and asthma prove this drug to be of very little value. Administration of the drug does not interfere with the direct skin test or with the passive transfer reaction.

Histamine-Azo-Protein (Hapamine)

Hapamine has had wide usage recently in the treatment of allergic disorders. Histamine is a substance of small molecular weight, rapidly dialyzable and in itself not antigenic. However, it can be rendered antigenic by combining it or conjugating it with some protein (haptene). Working with this combination (histamine-azo-protein), Fell demonstrated that precipitins are formed by injecting rabbits with this substance and that these precipitins are specific for the histamine part of the compound. The administration of histamine-azo-proteins in man stimulates the formation of specific precipitins in the serum. It is also shown that histamine may be neutralized *in vitro* by the sera of patients treated with histamine-azo-protein. However interesting these laboratory results may be, our experience and that of others indicates that histamine-azo-protein (hapamine) is not effective in the treatment of allergic disorders.

Histamine

An attempt has been made to increase histamine tolerance by the administration of increasing doses of histamine. This has been carried out either by the subcutaneous administration of a solution of histamine acid phosphate, or by the administration of 2.75 mg. of histamine acid phosphate in 300 cc. of normal saline intravenously daily for six successive days. It is interesting to point out that the administration of histamine subcutaneously or intravenously does not reproduce clinical allergic manifestations such as asthma or hay fever in an allergic individual. Nor is there any agreement of opinion that this form of therapy either helps to increase the tolerance of the patient to histamine or that it results in any clinical benefit. Histamine therapy is said to be effective in the treatment of a certain type of chronic vascular headache (histamine cephalgia), although the mechanism of its effect is not clearly understood.

Anthallan

The hopes of allergic patients were raised by a recent report which claims that 90 per cent of patients with nasal allergy, both seasonal and non-seasonal are benefited by such therapy. A review of the pharmacologic action of the drug fails to indicate that it has any definite antihistaminic value, particularly as regards its property to prevent the action of histamine on the blood pressure of cats. Extensive and more critical use of the drug in bronchial asthma, urticaria, hay fever and perennial allergic rhinitis fails to indicate convincingly any beneficial therapeutic action.

Antergan and Neo Antergan

French investigators have been working as early as 1932 on a series of chemicals for which the tissues would have a greater affinity than for histamine. Antergan (N'phenyl-N'benzyl-N-dimethylethylenediamine) and later Neo-Antergan ($C_{21}H_{27}N_3O_5$) (Ethylenediamine N-p-methoxybenzyl-N', N'-dimethyl-N-2-pyridymaleate) were finally discovered. Both of these are potent antihistaminic drugs in that if they are injected subcutaneously into guinea pigs they will protect the animal against the fatal result obtained from the administration of many times the fatal dose of histamine. Of the two, neo antergan is more potent and less toxic. The drug has been introduced recently on the American market but is still being investigated for its clinical application. The dose is 50-100 mg. and is available in coated tablets.

(Nu 1504) Thephorin

Nu 1504 (2-methyl-9-phenyl-tetrahydro-1-pyridindene). This drug is being investigated by us now. Protection against histamine in animals seems to be somewhat less than from other antihistaminic drugs. It is administered in doses of 50 mg. The therapeutic results obtained from its use in various allergic disorders are about the same as those obtained from other antihistaminic drugs. It is not effective in bronchial asthma; it is of doubtful value in migraine. It is beneficial chiefly in allergic rhinitis, hay fever and urticaria. Comparative studies carried on to date indicate it to be slightly less valuable than the other antihistaminic drugs. There are some few patients in our series, however, who responded to this drug and not to benadryl and pyribenzamine. Clinical studies are not as yet completed. Unlike the other drugs, it does not produce drowsiness and sleepiness. The chief side effects seem to be sleeplessness and dryness of the mouth.

Thenylene (N-alpha-pyridyl)-N-(alpha-thenyl)-N,'-N'-dimethylenediamine hydrochloride (AH42)

This is still a more recent drug to join the family of histamine antagonists. It is administered in scored tablets 50 mg. each every four to six hours. Its effect seems to be about the same as that of benadryl and pyribenzamine although our studies in this connection are not as yet completed at this date. Some of the patients receiving the drug have complained of severe side actions, such as drowsiness, palpitation and sleepiness. Our studies are not sufficiently complete to enable us to give a reliable appraisal of its value at this time.

Benadryl (Dimethylaminoethyl benzhydryl ether hydrochloride)

Bovet and Straub at the Pasteur Institute in Paris were the first to point out the antihistaminic value of derivatives of amino-ethanol and ethylenediamine. Many of these related drugs were shown to prevent histamine or anaphylactic shock in animals. However, they could not be used in man because of their toxicity. It is only recently that several new derivatives have been discovered which while possessing strong antihistaminic and antianaphylactic action in animals were not too toxic to be employed in man.

Benadryl (Dimethylaminoethyl benzhydryl ether hydrochloride or benadryl) protects sensitive guinea pigs against a shock dose of antigen or normal animals against a lethal dose of histamine. In man, when administered by mouth, it will interfere slightly with the whealing reaction obtained either by the injection of a specific antigen such as ragweed pollen in a hay fever patient, or by the intradermal injection of histamine. However, when applied locally, the drug is absorbed by the tissues and will interfere with the production of the whealing reaction. This would tend to indicate that the shock tissue has a greater affinity for the drug than for histamine. The mode of action of benadryl must therefore consist in the absorption of the drug by the shock tissue (skin and mucous membranes) and its interference with the action of the subsequently liberated histamine. The reaction is equally effective regardless of whether histamine is liberated by the introduction of a specific antigen, by mechanical stimulation, physical allergy, etc. The apparent beneficial antiallergic and antianaphylactic effect of benadryl is not due to a sympathomimetic action, nor is it due to the inhibition of formation of histamine, or to the destruction or neutralization of histamine. The drug is not sympathomimetic in action because its administration is not associated with peripheral vasoconstriction. It does not interfere with the liberation of histamine since it is equally effective in protecting animals against parenterally injected histamine.

Benadryl has been employed in the treatment of many allergic manifestations. The drug is available in the form of the elixir (10 mg. to the dram) and in capsules of 25 mg. and 50 mg. each. The dose is 50 mg. by mouth three times a day although in many instances, smaller doses have been found equally effective and less likely to lead to unpleasant side effects. It may be given intramuscularly or intravenously in doses of 5 to 15 mg. It is particularly valuable in the palliative treatment of acute and chronic recurrent urticaria. In the writer's experience, a total of 120 cases of urticaria and angionneurotic edema have been treated with satisfactory symptomatic relief in 74 per cent of the cases. Similar, although less dramatic results have been obtained in instances of seasonal hay fever (53 per cent). The results in vasomotor rhinitis, either of the allergic or non-allergic variety consist of some improvement in 45 per cent of all cases. The pruritus of atopic and contact dermatitis is often sufficiently relieved to minimize the skin trauma which occurs in these patients as a result of scratching. The drug has little if any value in the symptomatic treatment of bronchial asthma, eczema, and migraine. Indeed, in very few instances of asthma could the improvement be ascribed to the administration of benadryl. Unfortunately, a substantial number of patients (about 40 per cent) show definite side actions so that in many cases the drug has to be discontinued. These include drowsiness, confusion, headache, dryness of the mouth, palpitation, vertigo and in some instances restlessness and insomnia. Approximately 60 per cent of the patients who show side reactions complain of drowsiness. These side reactions, particularly the drowsiness and somnolence, are sufficiently important in ambulatory patients to have caused accidents in several instances. In our own experience, one patient became involved in an automobile accident because of confusion while driving. While it has been shown that no serious toxic effects result in animals from prolonged administration of the drug, all the evidence is not as yet in with respect to the long continued medication with this drug in man. Electroencephalograms taken on several patients who have received the drug over a period of time suggests the type of tracing which one obtains after prolonged administration of barbiturates.

Pyribenzamine
(N, N-dimethyl N^1 (x-pyridyl) ethylenediamine)

Pyribenzamine is another of the recently reported antihistaminic drugs employed in the treatment of allergic conditions. This drug is one in a long series of similarly related drugs which are aniline compounds and x-Amineopyridyl compounds of ethyl enamine; they have been investigated extensively both in France and in this country. It is found that pyribenzamine is more potent than benadryl in preventing the action of histamine on the guinea pig uterine strip and in histamine shock. It protects animals, both guinea pigs and dogs, against anaphylactic shock. In this respect its potency is about the same as that of benadryl. Its sphere of usefulness in allergic disorders is somewhat similar to that of benadryl. Some patients respond better to benadryl and others to pyribenzamine. The dose is 50 mg. or less and the tablets are scored so that a half tablet may be taken every three or four hours. Local application of the drug to the nasal mucous membrane in a dilution as low as .5 of 1 per cent has proved very irritating. Its side reactions are very much the same although somewhat less frequent than those of benadryl. The drug is effective in practically the same conditions which are relieved by the administration of benadryl, namely urticaria, angioneurotic edema, serum sickness, pruritus of atopic dermatitis and some cases of seasonal hay fever. It is less effective in vasomotor rhinitis and it is of very little value in bronchial asthma and in migraine. Its administration produces somewhat fewer side reactions than benadryl.

COMMENT AND CONCLUSION

Based entirely on the concept that allergic symptoms are due to histamine action, an attempt has been made from time to time to treat the allergic patient with various histamine antagonists. Of those drugs which are better known, it appears that hapamine, histaminase, anthallan, and histamine itself are of little if any clincial value. Benadryl, pyribenzamine, Nu 1504, Thenylene have proved useful only in the symptomatic treatment of certain allergic disorders. These are acute and chronic urticaria, the urticarial lesions of serum sickness, insulin and drug allergy, the pruritus of atopic dermatitis, seasonal hay fever and allergic rhinitis. The side actions evoked by these drugs limits their scope of usefulness. Some of their effect may be due to their sedative action. They do not prevent or alleviate the development of asthma in pollen-sensitive patients. Their use in no way replaces the need for a careful study and adequate treatment of the allergic patient.

FELLOWSHIPS IN PHYSICAL MEDICINE

In the past year the American Board of Physical Medicine has been established as a recognized medical specialty. Qualifications for examination for the Board include three years of clinic, hospital and laboratory training in institutions approved by the Board. The Department of Physical Medicine of the University of Minnesota Medical School has established fellowships of one to three years' duration providing the experience and training necessary to fulfill these qualifications. The departments and institutions affiliated with the Department of Physical Medicine for providing this training include the basic science departments of the Medical School, the Peripheral Vascular Clinic, the Department of Neurology, Minneapolis General Hospital, Rosemount Poliomyelitis Hospital, Minneapolis Veterans Hospital, and the Section on Physical Medicine of the Mayo Clinic. Rotating fellowships have been set up through these departments to provide experience in diagnosis and treatment of orthopedic, neurologic, vascular, and arthritis diseases. Within this broad general program it is possible to concentrate work on any field of special interest. Likewise for physicians interested in fields closely related to physical medicine such as orthopedics and neurology, it is possible to arrange special programs concentrating on the problems of those fields. In addition, time and facilities are available to do research on fundamental or clinical problems related to the practice of physical medicine.

The stipend of the Medical School fellowship is $1380 per annum. Veterans may obtain subsistence pay up to $2400. The fellowships at the Minneapolis Veterans Hospital carry a stipend of $3600. All fellowships are granted annually and are renewable for three years.

ANNUAL LECTURESHIP ANNOUNCED

The Minnesota Graduate Club and Alpha Xi Undergraduate Chapter of the Phi Delta Epsilon Fraternity announce their gift of an annual lectureship to the Medical School of the University of Minnesota. The first lecture will be given February 26, 1948, in the Medical Sciences Amphitheater at the University of Minnesota by Dr. William Roemmich of the United States Public Health Service, whose topic will be "The 1947 Chest X-Ray Survey of Hennepin County." The meeting will be preceded by a banquet when the lectureship will be formally presented to the University and accepted by Dean Harold S. Diehl of the Medical School.

Metrazol Therapy in Barbiturate Poisoning

A Case Report

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The barbituric acid derivatives are an extremely valuable group of sedatives and hypnotics and as such occupy an important place in medicine. However, since the 140 million inhabitants of the United States ingest about one and one-quarter billion grains of the barbiturate in a year, it becomes evident that gross abuse of these drugs is taking place. Especially is this true of phenobarbital which, according to reports, constitutes more than half of all the barbiturates sold. That accidental and suicidal overdose under such conditions is not uncommon will surprise no one.

This report concerns a case of phenobarbital poisoning in an attempted suicide. Mrs. A. M., a 41-year-old divorcee, was accused of petty thievery, and lost the position which she had held for nineteen years. After her recovery she stated she had been a "solitary drinker," consuming about one pint of whiskey a day, and that she was a fairly heavy cigarette smoker. She had recently experienced an unhappy love affair, and had been so despondent that she no longer wanted to live. She, therefore, took a tremendous overdose of the barbiturate in an attempt to end her life, ingesting 30 to 35 tablets of phenobarbital, a total of about 52 grains.

Case History

The patient was brought to the emergency room of the Swedish Hospital, Minneapolis, Minnesota, at 9:00 P.M., on the ninth day of February, 1947. She had swallowed the tablets approximately 45 minutes before admission. Respirations were six to eight per minute on admission; blood pressure was 100/60, pulse was very weak and feeble, barely perceptible in the radial artery. Artificial respiration was started promptly. She was in deep coma and complete areflexia. The stomach was immediately and thoroughly lavaged with 2 quarts of saline, and magnesium sulphate was instilled. She was given apomorphine without effect. Picrotoxin was administered at the rate of 1 mg. per minute with a total dose of 45 mgs. An improvement in the rate and depth of the respirations and in the color of the patient resulted, but the reflexes, even the corneal reflex, remained absent. An ampule of coramine was also given without apparent effect. The patient remained comatose, corneal reflexes were absent, respirations were shallow and cyanosis of the lips and mouth was present. Evidence of pulmonary edema with frothing at the mouth was noted.

At 9:45 P.M., 1000 cc. of a 10 per cent glucose solution in normal saline were given; oxygen was continued by nasal catheter, and the mucus removed from mouth and pharynx. Within one-half hour her blood pressure had dropped to 70/30, pulse to 64, and respirations were six to eight. Ephedrine, 25 mgs., was given at this time and the bed raised on shock blocks. One hour later the patient showed very little change although the blood pressure had risen to 92/50. Penicillin, 20,000 units every three hours, was started. During the night the patient developed incontinence, and at 2:00 A.M., another 1000 cc. of 5 per cent glucose were given.

Supportive therapy was carried on until 4:00 P.M. the next day, but without evidence of recovery. During this period the patient remained comatose with absence of corneal reflexes. She was cyanotic, coarse rhonchi were heard and fluid was apparently accumulating in the lungs. The blood pressure was 108/60. At this time 5 cc. of metrazol were injected intravenously and repeated in 15 minutes. The patient moved slightly and breathed more deeply, otherwise her condition changed but little. Twenty minutes later, 3 cc. of metrazol were given intravenously with immediate response manifested by a return of pupillary and corneal reflexes, also knee, biceps, and ankle reflexes. Lachrymation occurred and the patient began to moan. At 4:40 P.M., another 3 cc. of metrazol were given intravenously. The patient now began crying and struck out at the resident, protesting the saving of her life. The respirations, improved since the beginning of the metrazol treatment now became deeper and more regular. Facial color returned and pulmonary congestion decreased. The pulse became regular and stronger.

Twenty minutes later the patient had lapsed back into coma. During the next hour 11 cc. of metrazol were given, and another infusion of 1000 cc. of 5 per cent glucose was started. Consciousness returned for some forty minutes. At 6:30 P.M., the blood pressure was 108/58. During the next two hours, another 12 cc. of metrazol were injected into the vein. The patient, after 34 cc. of metrazol, now had periods of full consciousness lasting thirty to forty minutes. Metrazol was then given intramuscularly in 1 cc. doses every half-hour for the remainder of the night and part of the next day. In addition, 6 cc. were injected intravenously at 10:30 P.M. The patient now was almost continuously conscious, but another cubic centimeter was given into the vein at 2:30 A.M. on the eleventh of February. Two hours later the patient was sitting up, talking fairly coherently and exhibited marked restlessness.

At 8:00 A.M., the patient was fully awake, coherently answering questions and taking fluids by mouth. Two hours later when the woman became sleepy, a final dose of 6 cc. of metrazol were injected effecting the final and complete recovery except for her peculiar mental state. In all, 47 cc. of metrazol were injected intravenously and 33 cc. of metrazol were administered intramuscularly in a period of 18 hours. During this period the patient would regain consciousness following the injection of metrazol only to again lapse into coma, at which time another injection was given. The patient was watched carefully throughout this time, and the extent of the stimulation by means of the drug was balanced against the recurring depressed condition.

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It is interesting to note that the course of recovery of this patient, once the initial doses of metrazol had taken effect, paralleled closely that recorded by Androp[1] in a striking case of attempted suicide in which a 36-year-old male patient took 102 grains of sodium amytal. A total of 36 cc. of metrazol were injected intravenously with an initial dose of 9 cc. followed by 5 an 6 cc. doses at intervals in the course of twenty-four hours. Androp wrote, " . . . the patient reacted to repeated injections of metrazol by a return of vegetative reflexes, increase in rate and depth of respiration, etc., only to slide back into coma after an interval. The intervals increased in length until, after five hours of continuous vigil, the patient was out of coma. The dosage of metrazol can be regulated symptomatically, according to the rapidity and length of improvement; overdosage is thereby guarded against."

A number of reports have appeared in the medical literature on the use of metrazol in barbiturate poisoning. The immediate response to metrazol and the necessity for repeated injections of an adequate quantity of the drug to maintain the initial improvement, has been frequently emphasized.

Burstein and Rovenstine [2] report their experiences as follows: "Patients with suicidal intent who were reported to have taken large amounts of barbiturates, were also treated. . . . Although not in keeping with experimental evidence, the response following metrazol, with the doses employed in these cases, was more satisfactory than from picrotoxin. An initial injection of metrazol usually produced an improvement in respiratory rate and volume exchange. One or two succeeding doses caused definite cerebral stimulation and frequently awakened the patient."

The antagonism between metrazol and the barbiturates as shown in animal experimentation was reported by Jackson [3] who stated that in animals anesthetized with the barbiturates and other anesthetics, metrazol produced marked specific stimulation of the respiratory center, usually without any symptoms of tremors or convulsions. "And the specific opposing actions of such drugs as evipal and metrazol on the respiratory center seems to be so definite and clear-cut that, after the first injection of each drug (to test the individual sensitivity of the animal), one can thereafter predict with a high degree of accuracy the exact size of the dose of each drug which will be needed just to counteract the effects of the other." Goodman and Gilman [4] in describing the action of metrazol state, "Respiration is markedly increased by large doses of metrazol. The vasomotor and vagal centers of the medulla are likewise stimulated . . . the analeptic action of metrazol on the higher centers of the central nervous system is evident from its ability to counteract the depression produced by hypnotic drugs. This is prominent when directed against the depression caused by barbiturates, avertin, paraldehyde and chloral hydrate."

CONCLUSION

A record is made of the recovery of a female patient 41 years old, who was in critical condition after the ingestion of about 52 grains of phenobarbital, by the injection of 80 cc. of metrazol in divided doses over a period of 18 hours.

Initial doses of metrazol, large enough to produce a response in respiration, pulse and vegetative reflexes, were injected intravenously. Subsequent injections of metrazol were regulated as to size and frequency of dose to maintain the improvement during the time that the direct effect of the barbiturate continued.

Six months after this episode the patient was well, both physically and mentally, was gainfully employed, and leading a useful life.

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FARM AREA HEALTH LAGS

More than 100 years will be needed to cover the United States with adequate rural medical service, Secretary of Agriculture Anderson told the American Medical Association convention January 7. Anderson said less than 1 per cent of the plans for pre-payment of medical and surgical services was reaching country people. Typical of rural needs, he added, was the fact that infant mortality is one-fourth higher in rural areas than in cities and maternal deaths one-third higher.

Allergic Carditis, Pericarditis and Pleurisy

Report of a Case of Serum Sickness with Predominant Cardiac Manifestations and Symptomatic Recovery

(Preliminary Report)

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THE occurrence in a case of serum sickness of marked cardiac enlargement, pericarditis and pleurisy, considered in the light of the fleeting physical and X-ray findings, presented to the writer a striking and previously unobserved clinical syndrome which was deemed worthy of report.

CASE REPORT

A white male, aged 21, single, was admitted to Northwestern Hospital on November 17, 1947, complaining of weakness, nausea and vomiting, chills, precordial pain and dyspnea. About five hours before onset of symptoms and seven hours before admission he had received a prophylactic injection of tetanus antitoxin because of laceration of the right index finger. The patient's general health had always been good, the recorded physical examinations had been normal, and there was no history of asthma, hay fever, dermatitis or of acute rheumatic fever. While in the Navy, the usual routine prophylactic inoculations had been given.

Physical examination obtained from the hospital record[†] revealed the temperature to be 102.4° F., the pulse 160, the respiration 36, and the blood pressure 120 mm. of mercury systolic and 74 mm. diastolic. The face was flushed and the skin showed a fine papular erythematous rash over the head, neck, upper extremities, chest and abdomen. No cranial nerve disturbances were noted and there was no nuchal rigidity. The pulse was 150 to 160, regular, and no murmurs were heard. On the following morning, the leucocytes were 8800 per cu. mm., the neutrophiles 79 per cent, the lymphocytes 20 per cent, eosinophiles 1 per cent. The urine showed specific gravity of 1.016 and pH 5, there was no albumen or sugar, and cells or casts were not found in the sediment. The chest X-ray (Fig. 1) showed normal pulmonary and cardiac shadows. The treatment consisted of sedation with codeine and acetylsalicylic acid and intramuscular injections of penicillin, 30,000 units every three hours. The temperature, pulse and respiration lessened promptly and on the third hospital day were normal. The precordial ache was lessened the morning following admission and the patient was discharged on the fourth hospital day with the recorded diagnosis of serum sickness. On December 10, 1947, twenty-three days later, Dr. A. T. Hays, in his office, noted for the first time a systolic murmur at the apex.

The patient was first seen in consultation by the author, in the office, on December 19, 1947, thirty-two days after onset of illness, at which time the patient stated that the pain over the heart area had continued to bother him. During this period of over a month he was not well, although he worked off and on and noticed that the pain was alway aggravated by bending over. There was increased intensity of pain during the preceding day. Examination revealed a sick-appearing young man with pinched fascies, pallor and only slight cyanosis. The temperature was 100.6° F., the pulse rate was 120 and regular, the systolic blood pressure was 110 mm. of mercury and diastolic pressure was 70 mm. The heart showed a moderate increase in area of cardiac dullness; the point of maximum impulse was in the fifth intercostal space but was not forceful. The heart tones showed a normal intensity. There was a loud intense prolonged systolic murmur grade III, which was maximum in the third left intercostal space, also heard about as well at the apex. There was no edema of the subcutaneous tissues of the trunk or the extremities. The electrocardiogram showed sinus tachycardia and low T waves throughout. The hemoglobin was 12.3 gms., the erythrocytes were 4,260,000, the leukocytes were 15,600 with 16 per cent lymphocytes, 4 per cent eosinophiles and 80 per cent neutrophiles. The sedimentation rate of trythrocytes was 70 mm. in one hour, Westergren. The blood Wassermann was negative. The patient was immediately readmitted to the hospital December 19, 1947, for treatment and further study with the first impression of endocarditis. Bed rest, sedation, and oxygen by the BLB mask were instituted, as well as penicillin therapy, 100,000 units intramuscularly for one day, later every three hours for three days.

On the morning following admission a diffuse, loud to-and-fro friction rub was heard over the precordium throughout the cardiac cycle. The six-foot chest film showed diffuse cardiac enlargement (Fig. 2). The following day pain on breathing appeared, also pleural friction rub in the left chest and axilla with X-ray evidence of pleural effusion not present twenty-four hours previously (Fig. 3). The patient had quite marked precordial pain, and moderate pleural pain. The temperature was only slightly elevated, with a maximum of 100.6° F. (rectal) and after eight days became normal. Cyanosis was moderate. The patient improved strikingly within three days and became free from pain except for an occasional twinge in the left lower costal area. The pericardial friction rub disappeared during this period of abrupt improvement and was last audible along the left cardiac border. The pleural friction likewise promptly subsided.

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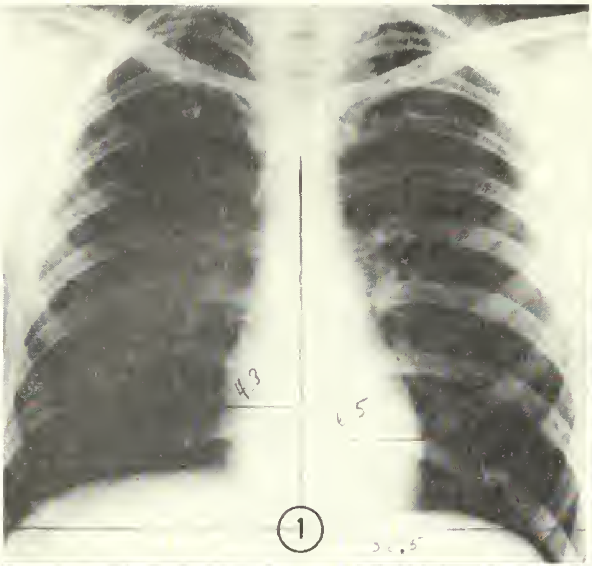
[*] Clinical Associate Professor of Medicine, University of Minnesota, The School of Medicine.

[†] The author is indebted to Dr. A. T. Hays for permission to use the first hospital record.



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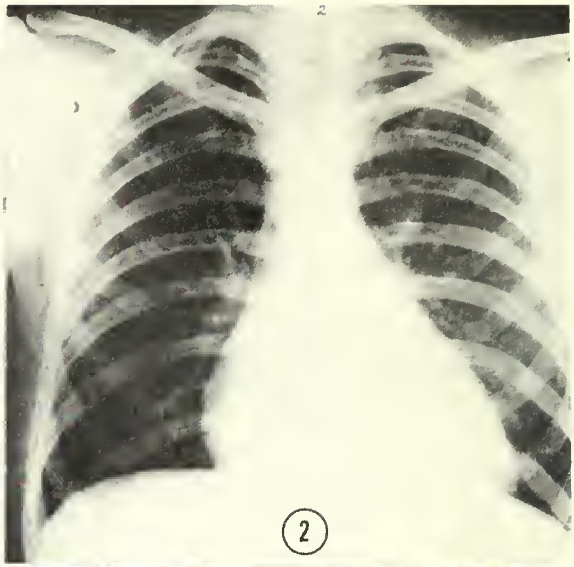

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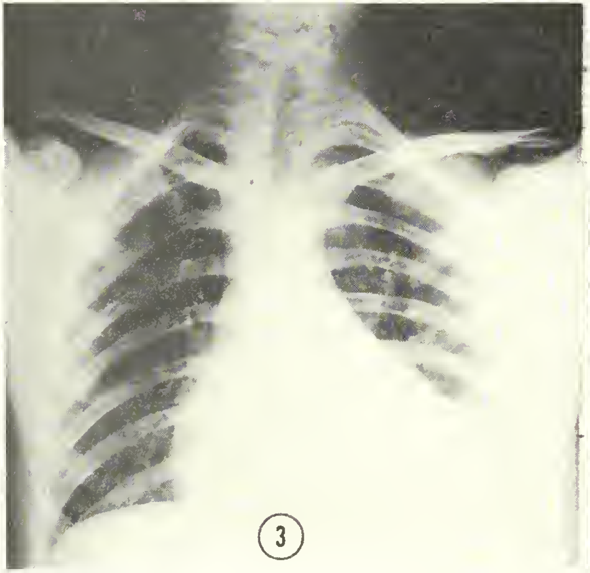

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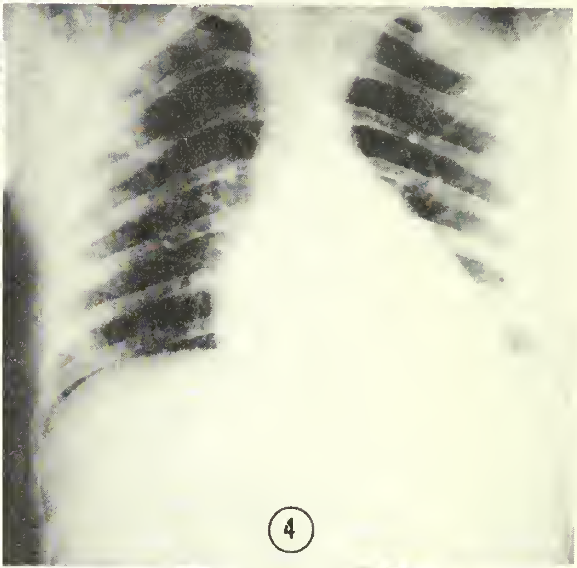

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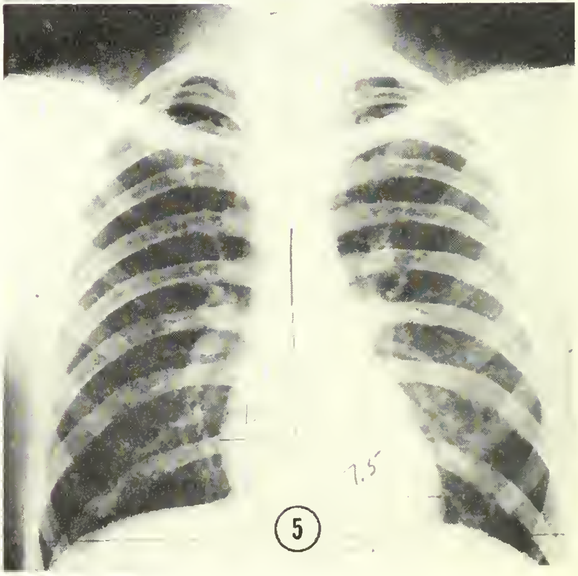

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Fig. 1. November 18, 1947. Normal cardiac and pulmonary shadows within the first twenty-four hours of onset of serum sickness. All chest films reproduced were taken at 6 ft.

Fig. 2. December 20, 1947. Marked diffuse cardiac enlargement on the thirty-third day of illness when the pericardial friction rub appeared.

Fig. 3. December 21, 1947. Marked cardiac enlargement and left pleural effusion on the thirty-fourth day of illness when pleural friction rub apepared.

Fig. 4. December 23, 1947. Marked cardiac enlargement with some clearing of pleural effusion on the thirty-sixth day of illness.

Fig. 5. December 27, 1947. The heart has greatly diminished in size and approximates the size of the heart in Fig. 1. The left pleural effusion has cleared entirely on the fortieth day of illness.

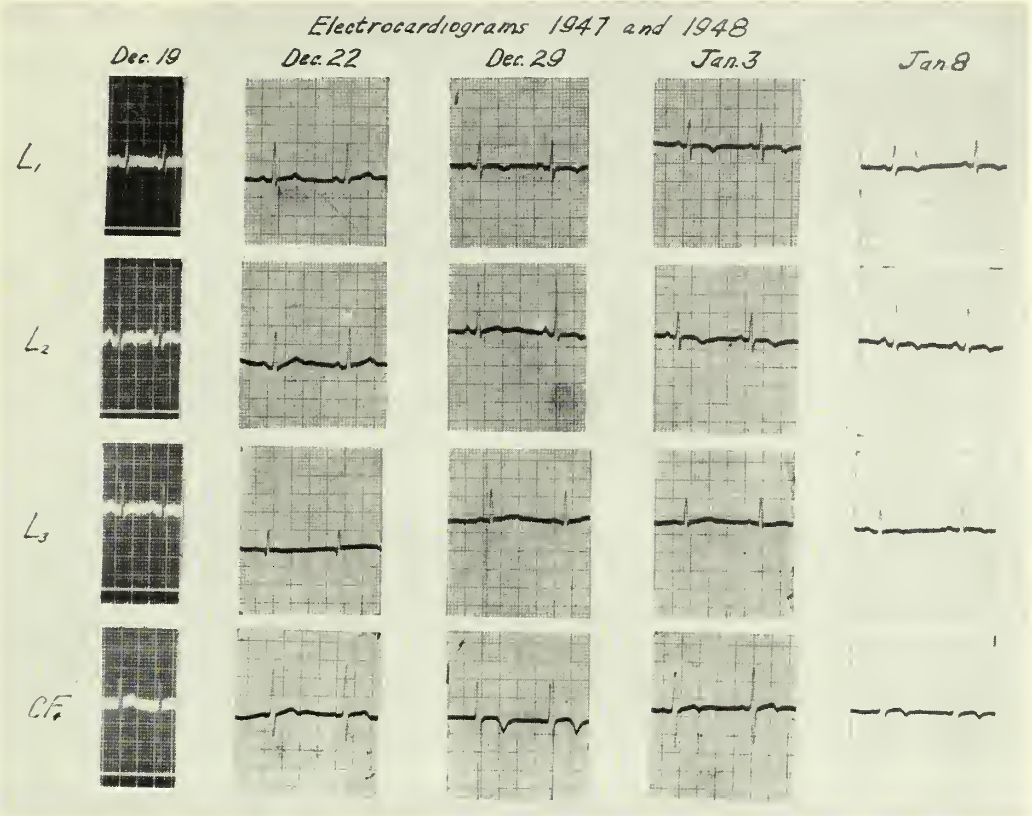

Fig. 6. December 19, at the time of cardiac enlargement without pericarditis. Low T waves throughout and diphasic T_2. December 22, two days after onset of pericarditis, diphasic T in CF_4. December 29, after clearing of pericardial friction rub and of pleural effusion, negative T_1 and T in CF_4, diphasic T_2. Findings consistent with pericarditis. January 3, increasing negativity of T_1 and T_2. January 8, concordant negativity of T waves throughout, consistent with pericarditis. Major changes occurred after symptomatic recovery. On January 14, the electrocardiogram had turned toward normal with positive T waves in leads 1, 2, and CF_4.

X-ray of the chest revealed partial clearing within five days (Fig. 4), complete disappearance of the pleural effusion within six days of its onset, and return of the cardiac area to approximately that of the normal film (Fig. 5). The patient had been free from symptoms except that moderate cystitis, subsequent to catheterization, appeared and subsided. The laboratory examination disclosed that the daily leukocyte count from December 22, 1947, through January 5, 1948, ranged from 6,400 to 9,800 except on December 28, 1947, when it was 14,500, and on January 1, 1948, when it was 15,850. The eosinophil count through the same period ranged from 1 to 7 per cent and twice in twelve counts was 4 per cent. Five sedimentaion rates through the same period ranged from 58 mm. to 102 mm. in one hour. The sedimentation rate was reduced to 41 mm. in one hour on January 14, 1948, and to 25 mm. five days later.

The electrocardiograms showed T wave changes, later with concordant T wave negativity in all leads, consistent with pericarditis (Fig. 6). On the fifty-eight day after onset of illness the tracing had turned toward normal with T_1, T_2 and T_4 becoming positive.

Leucopenia which usually occurs in serum sickness was not present. The variable leukocytosis noted two times may have been due to transient cystitis. Eosinophilia was noted only on one count. Ratner[1] states that contrary to popular belief, the eosinophiles show no notable change in serum sickness. The sedimentation rates of erythrocytes was increased in 12 of 14 cases of serum sickness reported by Gormsen and Heintzelman and quoted by Ratner.[1] The heterophile antibody reaction was positive in dilution of 1-64 on January 14, late in the course of illness, and was consistent with serum disease.

Discussion

The unusual nature of the process prompted consideration, after the rapid subsidance of most of the subjective and objective findings, of possible anaphylactic origin. Transient allergic infiltrations, such as Loeffler's syndrome, are becoming more and more commonly recognized.[2] Although allergic effusions are not frequent, they are known to occur in the pleural as well as in the peritoneal cavity.[3] Kojis [4] reports that Davidson found increased cardiac dullness in 72 per cent of 50 cases with serum sickness which was attributed to edema of the muscular wall; however, orthodiascopic studies were not done. The only reported case of pericarditis with effusion due to serum disease found by the author is that of Rosenhaupt[5] in 1905. Forty-three years ago this physician reported his own case of serum disease which occurred subsequent to the therapeutic use of diphtheria antitoxin. Symptoms of pericarditis with effusion appeared. Complete recovery ensued within a few days and 34 years later at the age of 63 the patient was hale and hearty.

Probably of even more interest is the concept of serum carditis supported by the description by Clark and Kaplin[6] of endocardial, arterial and other mesenchymal alteration associated with serum reaction. Proliferation of histiocytes in the mural and valvular endocardium was accompanied by multiplication of the interstitial cells of the myocardium. Necrotizing arteritis and periarteritis of the smaller coronary arteries were a prominent feature in one case. Clark[7] (1938) reported similar alterations with diffuse infiltrations of histiocytes in the subendocardial and connective tissues of the heart accompanied by focal infiltration between the heart muscle fibers.

The existence of serum disease in this and two other cases reported, as well as the absence of these lesions in those serum-treated individuals in whom serum sickness did not develop, support Clark's suggestion that the alterations he described represent the morphologic expression of a hyperergic state associated with serum disease. Such a concept is supported by the fact that Longcope[8] noted in rabbits extensive areas of focal degeneration of the heart muscle as well as cells of the kidneys and liver following repeated injections of foreign proteins. Wadsworth and Brown[9] reported a serum reaction following injection of 5 cc. of combined tetanus and gas bacillus horse serum in an 11-year-old boy complicated by acute carditis. A rubbing quality of the first tone at the apex was heard and various electrocardiographic changes and physical signs pointed to a diagnosis of acute carditis. Fox and Messeloff[10] reported a similar case in a boy aged 18 who showed generalized serum reaction and electrocardiographic alteration. These were considered to be due to the probable structural deviations similar to those noted by Clark and Kaplan.[6]

Swift,[11] Coburn[12] and others have considered that the lesions of rheumatic fever may be due to hypersensitivity to bacterial products. Rich and Gregory[13] emphasize that acute rheumatic fever has many features in common with the anaphylactic reaction of serum sickness and report studies which show that a type of carditis similar to that of rheumatic fever may occur in experimental serum sickness. The aforementioned authors remark upon the paucity of clinical study of the heart in patients with serum sickness. While it is in the realm of conjecture, it is intriguing to consider that the case reported supports clinically the concept of the similarity, morphologically, of rheumatic and experimental serum carditis as reported by Rich and Gregory.[13] Whatever theoretical interest accrues from such considerations, it is believed that the study of the clinical data of the case reported points inevitably to anaphylactic rather than infectious or rheumatic origin.

REVIEW OF SIGNIFICANT CLINICAL FINDINGS

A young man, previously well, who had received routine inoculations in the Navy, developed serum sickness with febrile reaction and erythema a few hours after a prophylactic injection of tetanus antitoxin. There was early precordial distress and moderate dyspnea; by the twenty-third day of illness a systolic murmur appeared and by the thirty-third day the heart area had definitely enlarged; all such findings were considered to be consistent with cardiac dilatation and possible carditis. On the thirty-fourth day of illness frank signs of fibrinous pericarditis with increased pain and friction rub appeared, associated with further increase of cardiac area, shown by X-ray. The heart silhouette did not suggest any marked pericardial effusion to Dr. R. Nord, roentgenologist. Transient urticaria appeared. On the thirty-fifth day left pleurisy with effusion developed. Between the thirty-sixth and fortieth days of illness the heart area receded to approximately normal and the pleural effusion disappeared. A completely acceptable hypothesis concerning the nature of the marked cardiac enlargement is difficult to establish. Both dilatation as well as pericarditis with some degree of effusion appeared to be factors. Large effusion was not considered to be present. The abrupt subsidence of pain, dyspnea and the recession of the cardiac area and pleural effusion is similar to the behavior of urticaria and edema affecting in unpredictable fashion various tissues and structures of the body as a part of focal anaphylactic reaction. Similarly, the coincident disappearance of a loud systolic murmur supports pathologic and physiologic concepts of the fleeting nature of infiltrations from focal anaphylactic lesions, in this instance involving the heart and pleura. Further report of findings in this case is anticipated.

SUMMARY

A case of serum sickness in a young man is reported in which marked cardiac enlargement, pericarditis and pleurisy developed and abruptly subsided. Reasons are given for the concept that the cardiac and pleural manifestations were anaphylactic in origin.

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Book Reviews

Signs and Symptoms, by Cyril M. MacBryde, M.D. Philadelphia: J. B. Lippincott Co., 1947. 439 pp. with 74 illustrations in black and white and 12 subjects in color on 6 plates. $12.00.

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Every physician is aware of the fact that the most difficult problem in taking care of patients who seek help is to make the proper diagnosis from the complaints presented. Few patients know their illnesses. The majority come to the doctor with certain symptoms and signs. Many times these do not fit in too well with the typical textbook descriptions of the various diseases. It would be of great help to the practitioner if he were able to develop quickly and accurately an approach to the handling of the disease which is causing the patient's complaints.

This book gives the physician just the assistance he has been looking for in the busy postwar period. The editor has compiled a monograph of all the common symptoms and signs, each one of which is satisfactorily discussed. There are sections on pain, headache, sore tongue and sore mouth, thoracic pain, abdominal pain, backache and back pain, joint pain, pain in the extremities, fever, disturbances of consciousness and of muscle movement, fainting, dyspnea, cyanosis, dehydration, edema, palpitation and tachycardia, cough, hemoptysis, obesity, weight loss and undernutrition, anorexia, nausea and vomiting, constipation and diarrhea, hematemesis and melena, jaundice, itching (pruritus), and nervousness and fatigue. Such an array of diagnostic wealth makes the book a "must" in every practitioner's library. A.V.S.

School Health Problems, by Laurence B. Chenoweth, A.B., M.D., Professor of Hygiene, University of Cincinnati, and Theodore K. Selkirk, A.B., M.D., Assistant Professor of Clinical Pediatrics, College of Medicine, University of Cincinnati; Pediatrician, Hamilton County, Ohio, Board of Health. With an *Outline on School Health Administration* by Richard Arthur Bolt, M.D., Dr.P.H., Lecturer, School of Public Health, University of California at Berkeley, Calif.; formerly Director, Cleveland Child Health Association and Associate in Hygiene and Preventive Medicine and in Pediatrics, Western Reserve University, Cleveland, Ohio. Third edition, 419 pages. New York: F. S. Crofts & Co., 1947; $3.00.

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The first two editions of this book have been quite popular, especially as a text for students in health education and physical education. It combines the practical experience of the authors, especially in school health work with a survey of the medical and educational literature, and has been one of the most scientific books available on the subject of school health.

Good judgment has been used in the selection of the more important and practical material from the great mass of material in school health work to make it both a practical as well as a scientific text. The end of each chapter also has a careful selection of references for further study where further study of the subject material and an exploration of the field is desired. All in all, this is an excellent text as an outline of the common health practices in school.

The careful revisions made in this third edition together with the new additional material will continue to make this text one of the popular college texts in school health.

A. O. DeW.

The Rehabilitation of Speech, by Robert West, Lou Kennedy, and Anna Carr. Revised edition. Harper & Brothers, New York. 650 pages, 39 figures, 14 plates. $5.00.

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With the increasing interest in rehabilitation stimulated by the experience of the Army and Navy in World War II, this book on the rehabilitation of speech appears as a welcome addition to the literature. It is divided into three parts, each of which emphasizes different phases of the subject. Part I deals chiefly with the pathology of speech as the rationale of its rehabilitation. Naturally, in discussing the pathology of speech, the authors are faced with the task of discussing briefly many of the diseases of the nervous system, the oral cavity and the nasal sinuses. They must also include many of the psychological mechanisms that play such an important role in human function and behavior. Obviously it is impossible to cover such a wide range of material in the 276 pages devoted to this task. For this reason, much of the material directly related to the diseases of the nervous system appears somewhat inadequate even considering that it is written primarily for nonmedical consumption. One of the best features of this first section is the "Study Guide for Diagnosis of Speech Disorders." This guide comprises a clear and concise outline of the various types of speech disorders and the simple approach to their classifications.

Book Two is devoted to remedial principles. This section is excellently done. The authors discuss briefly the various types of speech disorders and simple guides to their treatment. They state definitely that they are presenting merely guides or suggestions to be adapted and perhaps expanded by the worker to the individual case. The third section of this book presents a series of six representative case histories describing the various types of speech disorders, their evaluation, and the treatment procedures instituted in each case. This section is most valuable in enabling the reader to synthesize the material in the first two sections and to observe its application in a practical manner. The case histories are well chosen and presented in a clear, concise, and instructive manner. One feels, however, that a larger number of case reports would have been a definite improvement. Obviously it is impossible to illustrate adequately such a large volume of material with only six case histories.

The book is concluded with a series of appendices covering the technics for examination of speech, tests for hearing, tests for articulation, and finally a glossary of terms with their accurate pronunciation.

As stated by the authors, this book was written primarily for students and professional workers in Speech Pathology. However, it is so comprehensive that it should prove of definite value to the physician, who is often consulted by the family concerning such speech problems and who must play an important role in evaluating the involvement in his patient. A.B.B.

Clinical Methods of Neuro-Ophthalmologic Examination, by Alfred Kestenbaum, M.D. New York: Grune & Stratton, 1946, 384 pages.

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This book contains a tremendous amount of material on the subject of ophthalmology. It is fairly well organized and written in a simple manner which is easily followed.

The author has intermixed a great number of the neurological and neuro-ophthalmological principles so in certain parts the text is a little difficult to follow. In spite of the great detail contained in this book, no mention is made of the various changes in the fundus in neuro-ophthalmological diseases. As a brief reference book this volume should turn out to be most useful to both neurologists and ophthalmologists. A.B.B.

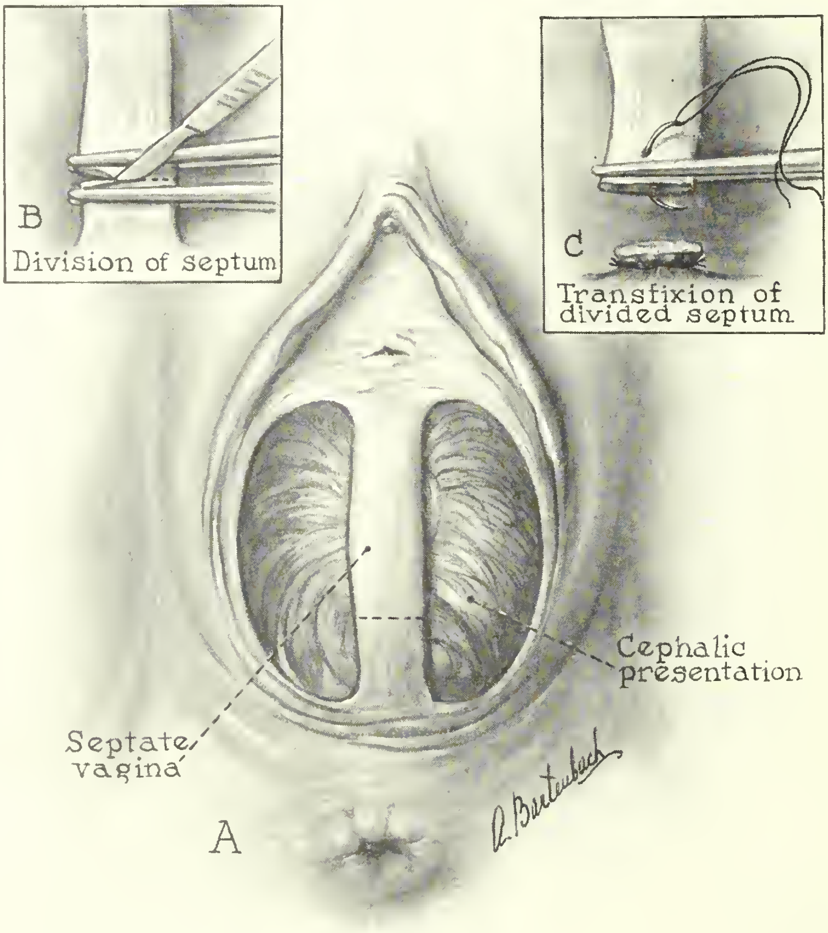
Septate Vagina as a Cause for Dystocia in Labor

Walter J. Reich, M.D.; F.A.C.S.*
Mitchell J. Nechtow, M.D.*
Chicago, Illinois

THIS is a case report in which a congenital vaginal septum prevented normal labor in the second stage. Double or septate vagina is due to complete or partial failure of the septum between the two müllerian canals to disappear. In some cases the vagina is double-barreled, while in other cases the septum is incomplete. Our case deals with the latter type.

CASE HISTORY

Mrs. K. R., a white female primigravida, whose last normal menstrual period was in May 30, 1946. The expected date of confinement was about March 7, 1947. The initial visit to the office disclosed early pregnancy of about 6 to 7 weeks duration. No other abnormalities were noted. Her Rh factor was positive and Kahn was negative. The prenatal course was uneventful. She entered the hospital on March 7, 1947, with false labor pains and some spotting, but active labor did not ensue. She left for home and returned in active labor on March 7, 1947. She progressed satisfactorily, so that on rectal examination she was completely dilated and at station plus 2 within 5 hours after the onset of good contractions. On re-examination rectally, the station remained the same in spite of strong contractions. She was placed on the operating table and prepared for delivery. At this time, on vaginal examination, a broad band of tissue measuring at least 2.5 cm. in width and edematous separated the vagina into two compartments. This band originated beneath the urinary bladder and



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extended to the recto-vaginal septum antero-posteriorly, and for about 3.5 cm. into the vaginal vault. The presenting head pounded against this non-yielding sling. It was so thick and tense that one could not push it to one side and effect the delivery. If the septum had been lacerated during the delivery, it could have caused a great deal of bleeding, which might have confused the operator as to the origin of the hemorrhage.

There remained only one course to follow and that was to clamp the septum in two places, to section it and transfix with number one chromic catgut sutures. As soon as the above was carried out, the presenting head almost shot out. The transfixed stumps were checked for possible bleeding after delivery and were found to be dry.

The puerperium was uneventful; both the baby and mother left the hospital in three days. Follow-up of the case with injection of lipiodol did not disclose any other associated genital anomalies.

Summary and Conclusions

1. An unusual case of a congenital vaginal septum which prevented the normal delivery of the fetus is presented.

2. Its probable embryonic origin is discussed.

3. The surgical management of this anomaly during labor in this particular case is discussed.

4. Artist's drawing of the anomaly is presented.

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Sioux Valley Medical Association
Dr. J. H. Kerr, *President*
Dr. Walter Benthack, *Vice President*
Dr. R. H. McBride, *Secretary*
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Dr. Gilbert Cottam, *Secretary-Treasurer*

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Dr. Roland G. Mayer, *Secretary-Treasurer*

AMERICAN STUDENT HEALTH ASSOCIATION

NEWS

The death of Dr. Henry L. Johnson, the Director of Student Health at Bowdoin College, on December 3, 1947, has just been reported. Dr. Daniel F. Hanley has been appointed Acting College Physician to take Dr. Johnson's place.

• • • • • •

A.S.H.A. BUSINESS SESSIONS—1947*

First Session of Council

May 7, 6:45 P.M., Room F, Hotel New Yorker.

Dinner Session

Dr. Ralph Canuteson presided.

Present were: Warren E. Forsythe, M.D., University of Michigan; Dean F. Smiley, M.D., American Medical Association, Chicago; Raymond W. Bradshaw, M.D., Oberlin College; E. Lee Shrader, M.D., St. Louis University School of Medicine; Ruth E. Boynton, M.D., University of Minnesota; Max L. Durfee, M.D., Iowa State Teachers College; Harold D. Cramer, M.D., University of Idaho; John E. Sawhill, M.D., New York University; W. Russell Greenwood, M.D., Rutgers University; Laurence B. Chenoweth, M.D., University of Cincinnati; Ralph I. Canuteson, M.D., University of Kansas; George T. Blydenburgh, M.D., Ohio Wesleyan University.

The following motions were made:

1. That the minutes of the last meeting of the Council on May 9, 1946, be approved as printed in the Proceedings of the 1946 meeting.

2. That the American Student Health Association discontinue its membership in the American Council on Education.

3. That Proceedings of Annual Meetings be exchanged without charge with foreign institutions interested in health promotion, which request such an exchange of materials, and be sent to foreign libraries and medical associations requesting these Proceedings. Moved by Dr. Forsythe, seconded by Dr. Durfee.

4. That the Council approve Dr. Ritenour's bill of $67.37, for his expense in representing the Association at the Annual National meeting of the Association for Health, Physical Education and Recreation. Moved by Dr. Chenoweth, seconded by Dr. Bradshaw.

5. That the American Student Health Association add to its contribution to the Third National Conference on Health in the Colleges, the sum of $1500.00, making the total contribution $2000.00. Moved by Dr. Greenwood, seconded by Dr. Bradshaw.

**From the Proceedings of the 25th annual meeting of the American Student Health Association, May 7-10, 1947, New York City.*

REPORT OF THE EYE HEALTH COMMITTEE*

Because it has been demonstrated that a large percentage of college students suffer vision breakdown each academic year and because success in college is in a large measure dependent upon effective and comfortable vision, it becomes obvious that vision conservation rates as a *major* health problem in all student health services. The American Student Health Association Committee on Eye Health, with the consultant committee of ophthalmologists and the National Society for the Prevention of Blindness have devoted ten years to the study of this difficult problem. This endeavor has resulted in studies, annual reports, publications in medical journals, joint Committee meeting and recommendations to the colleges and universities of the United States covering comprehensively, the fields of illumination, education, psychology of vision and vision testing.

It should be emphasized here that without the financial assistance as well as the professional advice of the National Society for the Prevention of Blindness, the work could not have been inaugurated nor continued with value to the Association, also without the expert (but uncompensated) work of the outstanding ophthalmologists on the advisory committee, the work could not have progressed, and would have no valid authoritative foundation, and could not have been recommended to the American Student Health Association and College Health Service Directors with any degree of finality.

During the war years the committee accomplished very little because depleted Health Service staffs had time for only routine medical and surgical service to the student. Men, well qualified in this field, had no time, nor energy to undertake study and research projects outside of their prescribed care of civilian students and those in the armed forces.

With the current postwar strengthening of Health Service staffs comes the possibility of revising and reviving the ante bellum responsibilities of the Committee. Accepting this opportunity on April 22, the joint committee with all members present, met in New York and spent the day in a re-study of the whole project. Deletions, simplifications, changes and amplifications were made in a serious effort to enhance the value of the Eye Health Committee to the Association and to all the various types of Health Services in the country.

A survey of illumination standards in United States colleges along with Health Service vision conservation programs and practices, is being planned for the coming academic year.

A copy of the revised recommendations will be sent to the Director of each Student Health Service listed in the records of the American Student Health Association.

R. W. Bradshaw, M.D., Chairman

**From the Proceedings of the 25th annual meeting of the American Student Health Association, May 7-10, 1947, New York City.*

MINNEAPOLIS ACADEMY OF MEDICINE

The regular monthly meeting of the Minneapolis Academy of Medicine was held at the Minneapolis Club on Monday, December 15, 1947. President J. C. Miller presided. Minutes of the last meeting were read and adopted.

Dr. M. O. Henry reported on the preparation for the Senior Meeting next month. Dr. J. C. Michael presented a patient and his case report—"A Case That Should Not Be." Dr. Ames W. Naslund presented his inaugural thesis on "Conditions Simulating the Roentgen Appearance of Intestinal Obstruction." This paper will be published subsequently in Journal-Lancet.

The 28th Annual Senior Meeting of the Academy was held at the Minneapolis Club on Monday, January 19, 1948, with Dr. M. O. Henry chairman of the meeting. There were 75 members and 60 guests present.

Mr. Raymond A. Scallen gave a very interesting address on the "Doctor in the Courtroom" before dinner. After the banquet Mr. Wilbur E. Elston, news editor of the Minneapolis *Tribune*, presented his impressions of his recent trip to Europe as an "off the record" discussion.

C. H. McKenzie, Secretary
H. E. Hoffert, Recording Secretary

...NEWS ITEMS...

NORTH DAKOTA

Dr. T. L. Donat, a native of Hungary and a graduate of Rome Medical College, has become associated with the Dakota Clinic of Fargo, specializing in X-ray and radiology. Dr. Donat came to the United States about ten years ago and received residence training in Chicago, where he practiced at Hines General Hospital. He served with the U. S. forces in World War II.

Dr. Edward A. Jones of Winnipeg, Manitoba, a graduate of the University of Manitoba Medical College and former officer in the Royal Canadian Air Force, has joined the staff of the Lake Region Clinic in Devils Lake, specializing in surgery and orthopedics.

Dr. Thomas E. Pederson, who for two years has been resident physician in internal medicine at the University of Iowa Hospital, Iowa City, Iowa, has joined the DePuy-Sorkness Clinic in Jamestown.

Dr. Robert L. Goulding, M.D., of Cleveland, Ohio, is now associated with Dr. Charles Vogl, in Bowman. Dr. Goulding was graduated from the College of Medicine, Cincinnati, in 1944, and received 13 months additional training at the Bethesda Hospital in Cincinnati. He was discharged from the Army in December, 1947,

In the fiscal year 1947 a general health grant of $85,563 was made to help North Dakota build up and maintain its local health departments, control communicable diseases, improve sanitation, and carry on health education demonstrations, personnel training, and other general public health services including industrial hygiene, and cancer control. North Dakota received $90,228 to carry out measures for the prevention, treatment, and control of tuberculosis in the state. An important part of tuberculosis control work, the making of mass X-ray surveys to discover the disease in its early, remediable stages, was made possible through grants-in-aid. The state was further assisted by consultation service, loan of personnel, demonstrations of photofluorographic units in the field, and the development of clinic and nursing services. Grants-in-aid for control of venereal disease in North Dakota amounted to $30,344 in the fiscal year 1947. Under the hospital survey and construction act of 1946, North Dakota was granted $750.39 for surveying its needs for hospitals and health centers and for developing a long-range, comprehensive construction program. Consultation services and technical aid in the state in various phases of its hospital program was also furnished by the public health service.

Members of the advisory council of the North Dakota state medical center met January 20 at the university to plan a campaign to acquaint the state with the project. W. W. Moore of Fargo presided. Other officers are George Aljets of Carrington, vice president, and Dr. A. H. Lawton, dean of the university school of medicine, secretary. Others attending were Dr. R. O. Saxvik of Bismarck, state health officer; Dr. John H. Moore, Dr. H. E. French and Dr. R. E. Leigh, all of Grand Forks.

North Dakota's birth rate of 29 per thousand population in 1946 shows an increase to 31.7 for the first ten months of 1947, according to Dr. R. O. Saxvik, state health officer. These figures compare with national averages of 23.3 for 1946 and 26.2 for the period January-October 1947. Death rates also show a favorable balance for North Dakota, with 9.3 deaths per thousand population in 1946, against 10 for the nation, and for the last year the state's total is 9.13 deaths while the national figure remained at 10. In 1946 the state had 33.7 infant deaths for each thousand live births; the nation as a whole had 35.1. In the year just ended North Dakota had 30 infant deaths and the nation 32.1. There are no national statistics on maternal deaths for the nation but North Dakota averaged a death per thousand live births both in 1946 and 1947.

Dr. Ted Keller, Rugby, was elected president of the Devils Lake District Medical Society January 7. Other officers are Dr. Lewis Gerber, Lakota, vice president; Dr. Donald Fawcett, Devils Lake, secretary-treasurer; and Dr. John D. Graham, Devils Lake, program chairman. Dr. William Fox, Rugby, will serve as censor. Dr. G. W. Toomey was named delegate to the state meeting.

Dr. H. C. Manaugh, Fargo, chief medical officer of Veterans Hospital and a member of the staff since September, 1939, left January 17 to become clinical director of the veterans hospital at Fort Howard, Maryland.

Sympathetic attention to the health of rural Cass county, especially the children, was given during 1947 by the county health department. Principals in the department are Dr. E. M. Watson, county health officer, and Miss Irma Smith and Mrs. Myrtle Wright, county public health nurses.

Mrs. Wright reports that 293 rural families were visited for the first time by nurses during the year, while 213 families were visited several times during the year. Purpose of these repeated visits differs, from assistance in bedside care to helping an active tuberculosis patient enter San Haven Sanatorium, or teaching a new mother proper care of herself and child.

Visits were made to 82 rural schools, and 442 children were given health examinations by the nurses, 267 by doctors.

The department purchased an audiometer, an instrument to measure hearing ability, which was used first at Casselton, where 314 children were tested, 34 revealing a slight hearing loss. It is planned to teach lay health committees to use the instrument, screening children in schools throughout the county, with the county nursing staff later checking hearing defects so revealed.

Rural teachers are required by state law to have health examinations every two years, and these are conducted by the county health office.

(Continued on page 73)

The state-federal mobile X-ray outfit was set up at 11 rural Cass centers, and 3,781 persons were X-rayed. There were 3,523 negative, 71 suspicious tuberculosis cases, 15 with tuberculosis pathology, 106 with other pathology. The county health nurses also gave 927 patch tests for tuberculosis, with 796 non-reactors and 108 reactors.

Dr. W. B. Pierce of the Quain and Ramstad Clinic was elected president of the medical staff at St. Alexius Hospital at the December staff meeting. Dr. P. L. Owens of the Roan and Strauss Clinic was named vice-president and Dr. R. W. Henderson, secretary-treasurer.

Dr. G. G. Thorgrimson of Grand Forks was elected president of the Grand Forks District Medical Society at the December meeting. Elected vice president was Dr. R. W. Vance, and Dr. L. B. Silverman was chosen secretary-treasurer. Both are from Grand Forks. Drs. R. E. Leigh of Grand Forks and Frank Weed of Park River were elected to represent this district at the state meeting, with Drs. N. A. Hardy of Minto and C. J. Glaspel of Grafton as alternates. Preceding the meeting a technical discussion was given by Dr. Walter Carley of St. Paul on treatment of neuropsychiatric patients.

A new student health center at the University of North Dakota will open at the beginning of the second semester in February. Housed in a temporary building, the set-up includes dispensary, medical office and six or eight beds for women and eight or ten for men. Dispensary service will be available to students 24 hours a day. Dr. R. O. Goehl, university physician, will maintain his present schedule of three visits to the health center each week, but officials said additional physicians to staff the hospital will be added.

Dr. H. A. Wheeler, Mandan, was named president of the Sixth District Medical Society at the organization's meeting in December. Other officers are: Dr. T. W. Buckingham, Bismarck, vice president and Dr. Charles Arneson, Bismarck, secretary-treasurer. Dr. Robert B. Radl, Bismarck, was named as a delegate to the state meeting next May and Dr. G. R. Lipp was elected to the board of censors. During the meeting Dr. Paul Dwan of the University of Minnesota presented a paper on rheumatic fever and congenital heart disease in children.

"There are a number of yardsticks by which the health of the community can be measured," said Dr. A. A. Nichols, acting Fargo health officer, "and by these we can be reasonably sure that the community health, in Fargo, has been well protected in 1947."

Dr. Nichols points to the index of communicable disease: "True, there was quite a variety of types, as the figures will show, but none of them was in any way a threat to the welfare of the community." This past year saw nothing comparable to the polio epidemic of 1946.

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(Continued on page 74)

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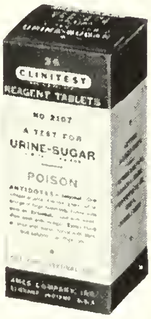

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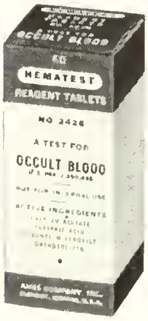

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been understaffed in the fields of public health nursing and sanitary engineering," said Dr. Nichols.

"Lack of properly trained personnel to fill needed positions limits the scope of our activity and service. However, the health department's program in the field of communicable disease prevention and control, maternal and child hygiene, health education, environmental sanitation and public health nursing must go on."

There were 565 cases of contagion reported to the department during the year, measles leading with 265, 119 of chickenpox, 45 whooping cough, and 44 scarlet fever. Of 21 cases of polio reported, 10 were non-resident. There were 19 cases of encephalitis, 9 of which were non-residents. Others were 22 cases of tuberculosis (discovered largely in a communitywide checkup), 12 of mumps, 5 diphtheria, 3 pneumonia, two each of meningitis and German measles, and one each of strep throat, smallpox and erysipelas.

"The so-called 'flu epidemic' last spring was not serious, except as it increased absenteeism in schools," said the health officer. "The only way to combat such an occurrence is to educate people to stay home and in bed at the first indication of coughs and colds."

Venereal disease is not very prevalent in Fargo, the health officer believes, if the few cases reported to his office "have any bearing on the true picture." State-city co-operation provides drugs, hospital and physician's care free to sufferers, and this is considered a factor in holding VD at a low point.

Big point in the community's health program in 1947 was the mass X-ray campaign in April and May, when 21,041 residents had free X-ray examinations, to determine incidence of tuberculosis. Of these 19,835 (94 per cent) were negative, 430 of the films were unsatisfactory, 377 films showed suspicion of the disease, 66 were positive finding of tuberculosis, and 333 showed other ills which should receive attention.

Important part of the health department's work is with school children. Despite a shortage of public health nurses, 28,619 inspections of children were made, including those returning to school after suspicion of contagious illness, those with suspicious symptoms, and those who for any other reason were deemed liable to be ill or to spread a contagious illness.

The health officer examined nearly 2,000 grade school and junior high school students, in the annual examination of first, fourth and new students. Nearly half of these (48.7 per cent) had conditions which were recommended for correction. Leading defect was enlarged tonsils (220), followed by need for dental correction (132 cases).

Ninety-eight immunization clinics were held, with 235 smallpox vaccinations, 270 for diphtheria, 129 for whooping cough, 4 for typhoid, 5 for tetanus and 28 Schick tests.

In the maternal welfare program, 91 child health conferences were held, 47 tiny infants and 239 preschool children were inspected. City nurses made 1,791 visits to morbidity patients, 210 visits to crippled children, and 396 children were given appointments for free dental care.

(Continued on page 75)

Hazen and the surrounding community dedicated its new hospital on January 11. The hospital will be operated by the Lutheran Hospital and Homes Society, a non-profit organization. The society is active in hospital work in South Dakota, Wyoming, Montana, Colorado, Iowa and Nebraska. This will be the first hospital in North Dakota to come under their jurisdiction. It has three homes for the aged and one home for crippled children in this state, however. The Hazen hospital board consists of H. E. Mueller, president; Dr. E. G. Vinje, vice president; Hubert Stoelting, secretary and R. M. Stroup, treasurer. The hospital is North Dakota's newest medical unit.

The Sheyenne Valley Medical Society held a meeting in January at the Mercy Hospital, Valley City, North Dakota. New officers are Dr. J. P. Merrett, president; Dr. G. Christianson, vice president; Dr. C. J. Meredith, secretary-treasurer. Dr. Kent F. Westly of Cooperstown is a new member.

After successfully completing the North Dakota state medical board examinations on January 9th, 18 men were authorized to practice medicine in North Dakota. As announced by Dr. G. M. Williamson, secretary of the examining board, the list includes Drs. Donald P. Erickson, Robert W. Huber, Lloyd S. Ralston and John A. Sandmeyer of Grand Forks.

Others passing the examinations were Drs. James Glenn Barrie of St. Vital, Manitoba, Melvin E. Beltz of Wahpeton, Robert R. Cochran and John R. Williams of Bismarck, Glenn W. Sibel of Harvey, Orlando Johann of Grafton, Edward A. Jones of Devils Lake, Francis T. Lytle, Aisle K. Lewis, John E. McAllister and Robert Rodgers of Fargo, Thomas Pederson of Jamestown, Duane F. Pile of Mandan and Fritz B. Schleinitz of Hankinson.

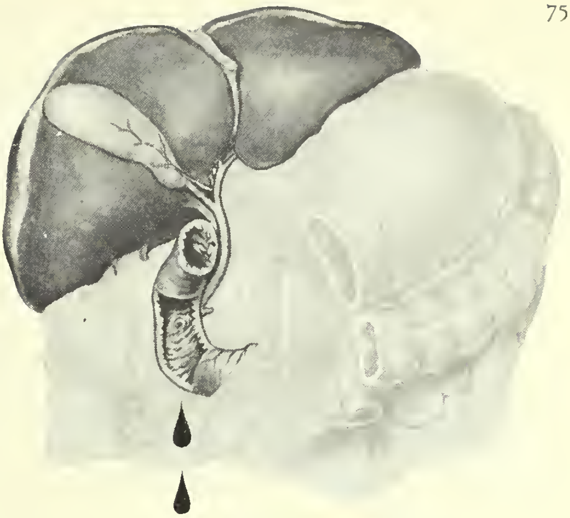
Besides Dr. Williamson and Dr. O. W. Johnson of Rugby, president, members of the state board of medical examiners are Dr. D. J. Halliday of Kenmare, Dr. J. Sorkness of Jamestown, Dr. A. E. Spear of Dickinson, Dr. F. E. Weed of Park River, Dr. W. A. Wright of Williston, and Drs. W. H. Long and O. A. Sedlak of Fargo.

NEWS FROM SOUTH DAKOTA

During 1947 the general health of South Dakota had never been better, the state board of health reported. Assistant state health officer Dr. G. J. Van Heuvelen said that on the average, less communicable diseases were reported than during any other year and general health conditions of individuals was the best on record. He pointed out that only one smallpox case and 24 cases of polio were reported in South Dakota during the past year, which was far below the number that can normally be expected.

Dr. William E. Olson has been appointed clinical director of the Fort Meade Veterans Hospital, Rapid City. He succeeds Dr. William W. Bourke, who has been transferred to a veterans administration hospital in

(Continued on page 76)



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*Albrecht, F. K.: Modern Management in Clinical Medicine, Baltimore, The Williams and Wilkins Co., 1946, p. 170.

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Indiana. Dr. Olson has been on the medical staff at Fort Meade for the past three years and recently returned from Chicago where he attended a specialized school of medicine.

Dr. Robert J. Delaney was elected president of St. Joseph's hospital staff, Mitchell, at the regular annual dinner held January 6 at the hospital. Other officers include Dr. W. H. Fritz, vice president, and Dr. B. R. Skogmo, secretary.

Dr. Guy E. Van Demark and Dr. Robert E. Van Demark have announced that their brother, Dr. Walter E. Van Demark, is now associated with them at the Sioux Falls clinic. His practice will be limited to injuries

Dr. B. S. Clark of Spearfish was elected president of the Black Hills Medical Society at the annual meeting of the organization in December. Other officers elected were Dr. H. E. Davidson, Lead, vice president, and Dr. Glen Heidepriem of Deadwood, secretary-treasurer. Dr. Lyle Hare of Spearfish spoke on "Cancer Detection," basing his subject on a recent visit to the cancer clinic at Minneapolis. Other speakers were Dr. Davidson who gave a scientific discussion on "Acute Hepatitis" and Dr. W. A. Geib of Rapid City.

Dr. H. Russell Brown, Watertown, president of the South Dakota State Medical Association, told members of the Seventh District Medical Association at their

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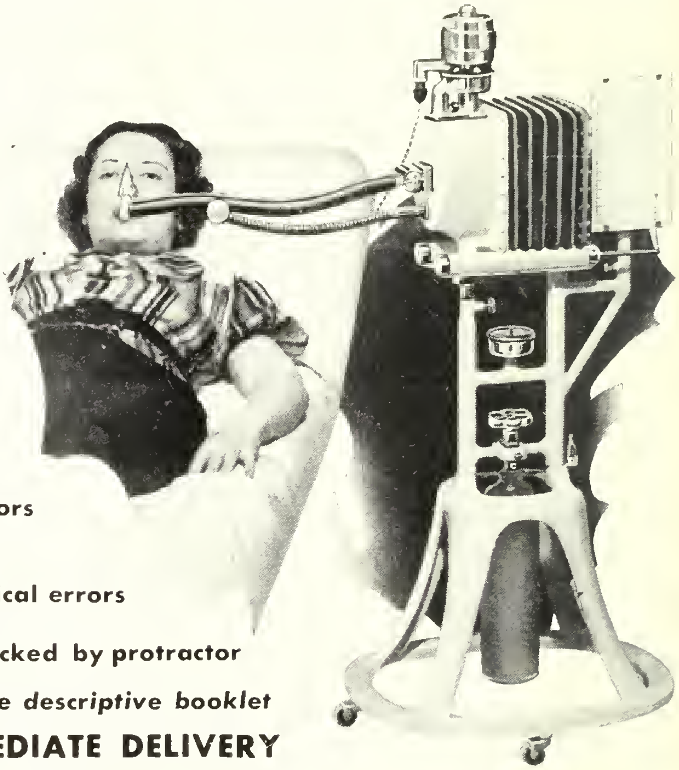

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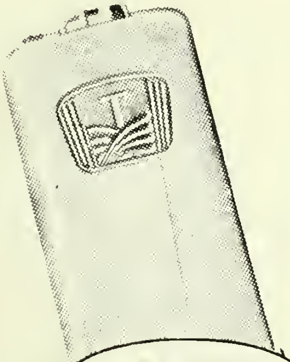

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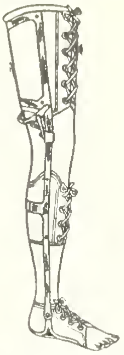

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Surgical Anatomy and Clinical Surgery, two weeks, starting February 16, March 15, April 12.
Surgery of Colon and Rectum, one week, starting March 8, April 26.
Surgical Pathology every two weeks.
FRACTURES and TRAUMATIC SURGERY: Intensive Course, two weeks, starting June 7.
GYNECOLOGY:
Intensive Course, two weeks, starting February 23, March 29.
Personal Course in Vaginal Surgery starting March 22, April 19.
OBSTETRICS: Intensive Course, two weeks, starting March 15, April 12.
MEDICINE:
Intensive course, two weeks, starting April 26.
Personal Course in Gastroscopy, two weeks, starting March 29, April 19.
Electrocardiograph and Heart Disease, four weeks, starting February 16, May 3.
CYSTOSCOPY: Ten day course starting March 1, March 15, March 29.
DERMATOLOGY:
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December meeting in Sioux Falls, that the establishment of a four-year medical school in South Dakota is one of the major problems facing the medical profession in the state at the present time.

He said that the state association has a fact-finding committee at work which will make recommendations to the state legislature at the next session.

The district group held its annual election during the meeting, renaming Dr. J. A. Nelson, Sioux Falls, president, and Dr. H. M. Dehli, Colton, vice president. Dr. A. M. Harris, Sioux Falls, was elected secretary to succeed Dr. C. J. McDonald, who held that office for six years.

Dr. Frank A. Rudolph, Rapid City physician, has been reappointed Pennington county doctor for 1948 by the county commissioners in January. He was appointed to the position temporarily three months ago to fill out the unexpired term of Dr. A. W. Paulson for 1947.

Construction of a new Huron Clinic building at Fourth Street and Kansas Avenue S.E. will be started March 15, it was announced by Dr. J. C. Shirley. Dr. Shirley said the building contract has been signed with a Huron contractor who already has "secured much of the building material, and plans to start excavating March 15, with the intention of having the building ready for occupancy by January 1, 1949. It will have office space for 12 doctors on the main floor." Associated with Dr. Shirley in the Huron Clinic now are Dr. William Saxton, Dr. H. L. Saylor, Dr. B. T. Lenz, Dr. H. L. Adams and Dr. Hans Jacoby.

Serving as a metropolitan center for the 102,000 persons living in a radius of 100 miles, Rapid City is the logical location for a medical center, studies of the United States public health service reveal. This information was received January 5 by campaign headquarters of the Black Hills Memorial Hospital.

MINNESOTA

Dr. Paul B. Magnuson, a native of St. Paul and a nationally prominent orthopedic surgeon, was appointed chief medical director of the veterans administration on January 14, to succeed Dr. Paul R. Hawley, who resigned December 31.

Three Minnesotans have been named to the council of the National Committee for Mental Hygiene, Dr. George S. Stevenson, medical director, announced January 11. They are Dr. E. Alan Challman, Minneapolis, Minnesota Mental Hygiene Society president; Dr. Benjamin M. Spock, child psychiatrist at the Mayo Clinic and Rochester, Minn., child health project, and Dr. Alice L. Shea, Minneapolis, associate professor of social work at University of Minnesota.

Dr. Arthur H. Wells, Duluth, acting president of the Minnesota Cancer Society, has been named to fill the unexpired term of the late Dr. William A. O'Brien, as a director of the American Cancer Society.

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PREPARATION OF MANUSCRIPTS

JOURNAL-LANCET extends an invitation to the profession for articles with the understanding that they are original contributions not previously published.

Manuscripts are to be typed on one side of the paper with double spacing. Illustrations must be in the form of glossy prints or drawings in black ink. Please do not attach legends to the pictures. A reasonable number (two or three) illustrations are published free of cost; special arrangements must be made for excess or highly finished illustrations or tables.

Bibliographic references should be at the end of the manuscript and not in footnotes. Each reference should include the following information in the order indicated: Name of author with initials; title of article; name of periodical; volume, page and year. Reprints are prepared on order.

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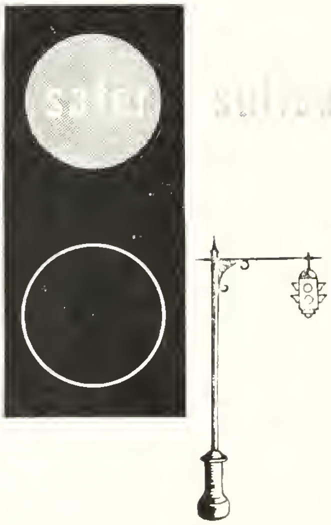

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The JOURNAL LANCET

Minneapolis, Minnesota
March, 1948

Vol. LXVIII, No. 3
New Series

Peripheral Circulatory Disease and the General Practitioner

H. O. McPheeters, M.D.
Minneapolis, Minnesota

At this time I will try to discuss briefly the peripheral circulatory diseases of the lower extremity, as seen by the general practitioner. Even though he may not do his own surgery, he should know what to advise, how it should be done, and what care should be given postoperatively. He is the one who must live with his patients during the active treatment as well as afterwards. It is his responsibility to carry on the treatment at home after the consultation and care by the specialist. With this cooperative effort the patient will receive the best and most effective care.

The common circulatory disturbances of the lower extremity in the order of the frequency of their occurrences are:

1. Varicose Veins
2. Intravascular Closure of the Deep Veins:
   a. Phlebothrombosis
   b. Thrombophlebitis
3. Acute Arterial Embolism
4. Peripheral Arteriosclerosis
5. Thrombo-angiitis obliterans (Buerger's disease)
6. Raynaud's disease
7. Chronic Lymphatic Edema: lymphœdema praecox or simplex of Barker.[17]

I will discuss them in that order.

VARICOSE VEINS

Varicose veins are simply normal veins, that for some reason or other, have become dilated, elongated and tortuous. They usually involve the superficial system of the lower extremity. They may also be seen elsewhere.

Etiology. It is often difficult to state the definite cause in the individual and specific case at hand. Fully 50 per cent of all cases show a definite hereditary factor. It is very common to find in the history that parents or grandparents had extensive varicose veins.

Acute infectious thrombophlebitis, often called "milk leg," is often the activating factor. The associated infection damages the valves of the veins as well as their walls. The veins then tend to dilate under the stress and strain of normal life.

Long hours in the erect posture, in particular those occupations that demand much standing, must be considered a cause. These postures permit the forces of gravity to continue. Under this constant force the vein walls simply dilate and become varicose.

Pregnancy, with its disturbance of ovarian hormones[31] which permit a marked relaxation of all smooth muscles throughout the body, is a common cause. The effects of this are commonly seen in the dilated ureters and the accompanying pyelitis so commonly seen and found by the urologist during pregnancy. I do not believe the pressure of the enlarged uterus is as much a causative factor as has been attributed to it in the past.

Deficient musculature and tone to the vein walls, just as in the development of any other congenital deficiency or anomaly, best explains many cases. The abnormally thin walls simply give way under the stress and strain of the normal life. This would account for the occurrence

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Presented before the North Dakota State Medical Association meeting, Fargo, North Dakota, May 27, 1947.

of the varicosities first in scattered areas and without any marked noticeable, reverse flow from the sapheno-femoral junction.

Treatment. Any effort at the treatment of varicose veins has as its object the obliteration of the varicose segments. On first thought this could well be done by surgical removal.[40] This, however, does not take into consideration the fact that we are dealing with a degenerative condition the same as occurs elsewhere throughout the body as we grow older. We will have more varicose segments form regardless of what method is used, and it is only by the recognition of this fact and by giving treatment accordingly that we may hope to obtain and maintain good results in the treatment of this condition.

All tests prove that in any well developed case of varicose veins there is a definite reverse or overflow outward and downward in the varicosed system.[35] In most cases this comes from the sapheno-femoral junction and the long saphenous system.[30] About 5 per cent are from the popliteal and the short saphenous system. It must be admitted that incompetency of the communicating veins does occur with an outward flow through the perforating veins. As a rule, however, this is not marked.

It must be said that there are still many adherents to the principle that a very careful, complete, and radical dissection and removal of all the varicose segments, either before or after having been injected, is the best method of treating varicose veins.[40]

After having cared for more than 20,000 varicose vein patients and having done 4,200 sapheno-femoral vein ligations during the course of their treatment, I have very definitely come to the conclusion that the injection method of treatment, combined with a carefully done high sapheno-femoral ligation and a retrograde injection in the extensive case, is by far the best method of treatment.[34]

In the treatment of varicose veins we inject a solution directly into the vein which will so damage the lining of the vein as to cause a clot or thrombus to develop, with a later complete organization and obliteration of the vein lumen. The ideal solution for this purpose has not yet been found. The most commonly used solutions are sodium morrhuate, sylnasol and monolate, each in 5 per cent strength, and soricin 3 per cent. The last one to appear on the market is sotradecol. This is a synthetic product, and it is claimed that the possibility of allergic reactions are less with its use. One of these solutions is equally as effective as the other, and an occasional patient will be found who is allergic to them all.

The theory of the empty vein technic should be followed in all cases, both in the treatment of the simple cases at the office and in the combined ligation and injection method at the hospital.[34]

Technic. With the patient standing on a stool and in a good light a careful examination is made from toes to groin. This is very important. The full extent of the varicosed system is studied and tests (P.P.T.) are made to determine the size of the great saphenous vein at the groin, and to see if there is a reverse flow outward from that point. If there is, or if the vein at the junction is 1½ cm. or larger in diameter, the patient should have a high sapheno-femoral ligation performed preliminary to the injection treatment. If the varicose veins are smaller, and only over the lower legs with little or no reverse flow, they can be treated by the injection method only.[36]

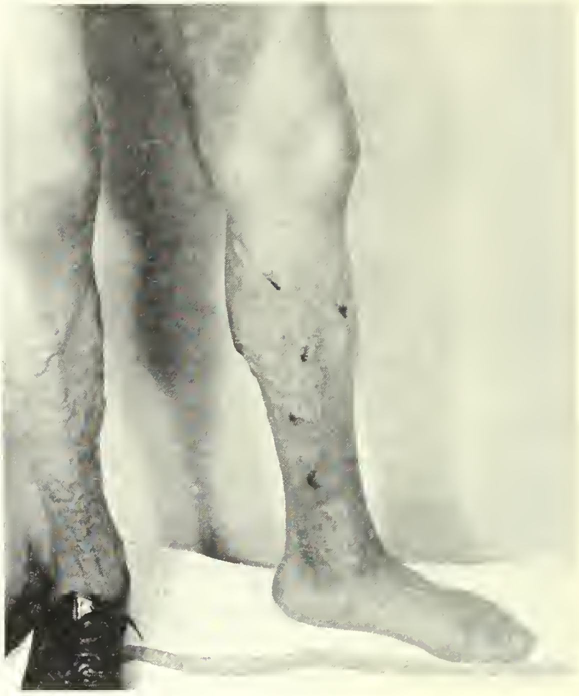

Fig. 1. Selected sites of injection marked.

If the case is to be treated by the injections only, the patient should stand on a stool, while the areas to be injected are cleansed and the varices to be injected marked (see Fig. 1). The injections should be about 3 to 4 inches apart along the vein. About six segments should be marked in the average case. The sclerosing solution is drawn into small 2 cc. syringes which have good suction and are fitted with 1½ inch, 23 gauge, short bevel needles. As a rule there is ½ to ¾ cc. of the solution in each syringe. With the patient lying down, the needle is introduced into the lowermost varix (see Fig. 2), the leg is raised to an elevation of 35 degrees for one minute to empty the veins, the tourniquet is then applied above the patella (see Fig. 3), and the solution is injected into the empty vein *as* the leg is lowered to the foot-rest about 35 degrees below the level of the table. With speed, the sclerosing solution can be injected into the rest of the marked segments, one by one, before they become filled with venous blood (see Fig. 4). In the partially filled vein there is always enough blood in the scattered segments to milk into one varix, so as to fill it enough so the needle can be introduced (see Fig. 5). The tourniquet is left in place two or three minutes and then the needles are withdrawn and pledgets of cotton are strapped over them, the same as is done with any

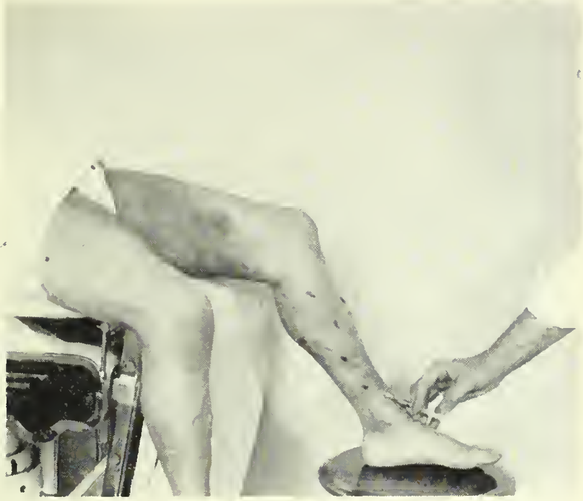

Fig. 2. Needle inserted into lowest varix.

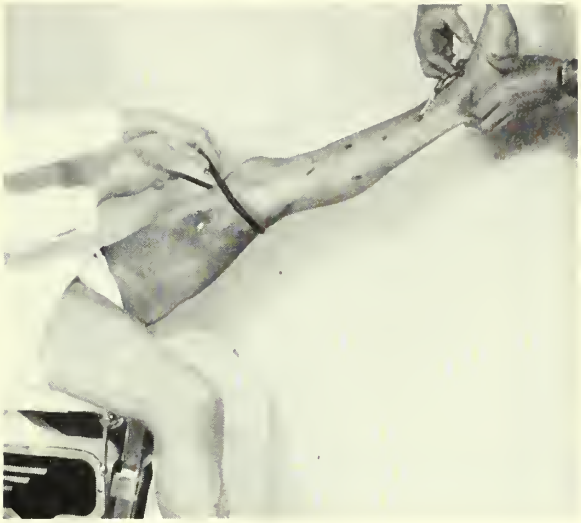

Fig. 3. Leg is elevated so as to drain varices. Tourniquet is then applied.

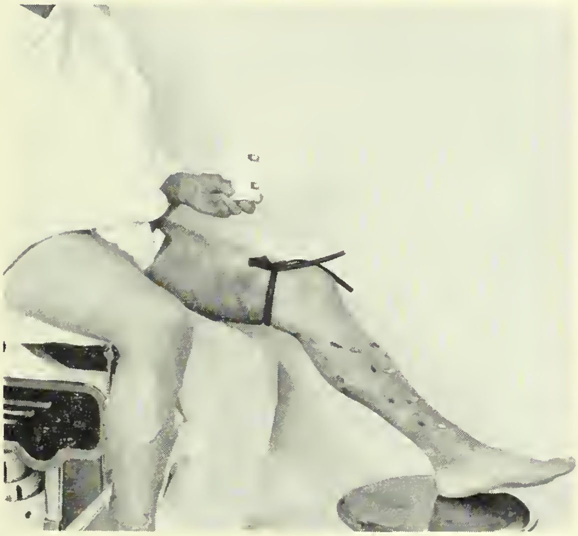

Fig. 4. All injections made with tourniquet still in position.

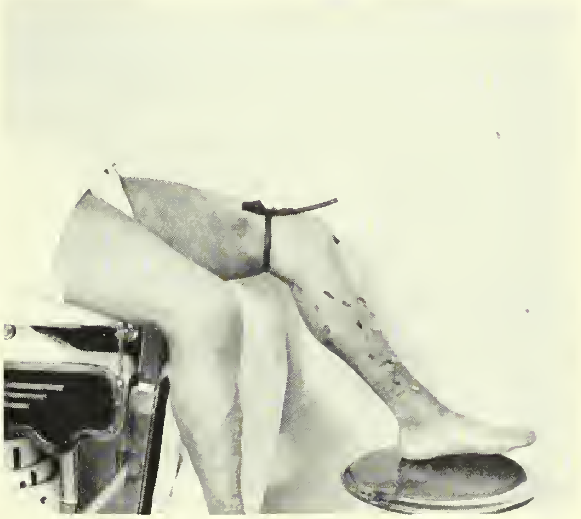

Fig. 5. Have patient sit with leg dependent and tourniquet applied for three to five minutes. This increases the pressure in the deep system and retains the sclerosing solution locally.

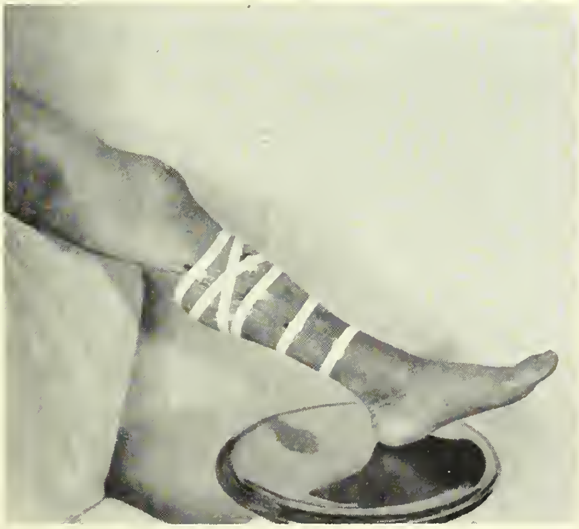

Fig. 6. As needles are removed, pressure pads are applied to avoid leakage.

venipuncture (see Fig. 6). The patient is instructed to walk five blocks as soon as he leaves the office, and to continue walking a great deal the rest of the day. The more the patients walk, the better result they will have; the less they will notice the soreness of the reaction, and the less worry we have that an embolus may develop. As a rule, about five injections are given into the scattered loops at each sitting. Subsequent injections are given at intervals of seven to ten days until the case is completed. If there is much soreness after the injections, hot wet compresses for three hours each night, together with a tight supporting bandage when up and about, will give much relief.

A high sapheno-femoral ligation should not be attempted except in a regular operating-room and with the necessary surgical help and assistance. If the attending physician does not operate, then the patient should be put into the hands of a competent surgeon. The loss of many legs can be attributed to this lack of forethought.[10,13,14,15]

At the time of the ligation the course of the vein at the groin is marked with a scratch or a skin pencil. The percussion test (P.P.T.) is of great help in doing this. A second line is made just below and parallel to the inguinal ligament. A wide local infiltration is made with 1 per cent novocain. The incision is made and all bleeding points are tied. Spring retractors hold the wound open well, put the tissues on tension, and help to make the dissection easier.[34] A number ten spring retractor is of special help. The vein is isolated and sectioned and 10 cc. of $2\frac{1}{2}$ per cent strength of the sclerosing solution is injected distally with the empty vein technic. This is done by tilting the table into a marked Trendelenburg position and raising the leg high for one minute. Reverse the table quickly to 20 degrees down and inject the solution as the leg is dropped to the table. The vein is then ligated and the wound is washed with normal saline.

The proximal stump is then dissected upward above all branches to the foramen. It is ligated flush with the wall of the femoral vein. Be very careful that no clamp is placed closer than $\frac{1}{4}$ inch of the femoral vein and that the ligature is well proximal to the last clamp. A purse-string suture is placed about the foramen and the wound closed with interrupted sutures.

Immediately after the operation, straps of adhesive are placed over the varicosed segments and if they are extensive, tortuous, and large, then pads of cotton sufficient to compress the veins are strapped over and along the segments and held in place with the elastic adhesive. This should be very tight to support the inflamed veins during the reaction of the next five days. The Ace No. 1 bandage, 4 inches wide, is the best for the lower leg. As soon as the bandage is applied, the patient is told to walk about two blocks up and down the hospital corridors. They may then dress and go home with instructions to walk for five minutes out of each hour until 10:00 o'clock that night. The walking should be very brisk as this stimulates the pumping effect of the calf muscles which rapidly and completely wash all the sclerosing solution out of the deeper veins of the lower leg and thus prevents damage to the deep system.[30] The dressings should be changed for the patient's comfort on the second day postoperatively and the sutures removed on the seventh day. Subsequent injections are given at weekly intervals at the office, beginning about three to four weeks postoperatively, and continued until the case is completed, as with the simple injection cases.

It should again be emphasized that regardless of what method of treatment is used, or who may give it, the patient will develop more varicose veins as time goes by and that these should be injected at yearly intervals. Only with this systematic care can the patient be assured of a good result from the injection treatment of his varicose veins.

Complications. No discussion of varicose veins would be complete without discussing the treatment of the complications: eczemas, ulcers, and chronically swollen lower legs. These complications develop because of, and secondarily to, the stasis and edema in the tissues occurring as the result of the reverse flow and the loss of valve function in the veins. A definite chain of events develops. Following this stasis the patient develops a pruritus. The scratching causes an infection to develop and this in turn aggravates the skin condition. Oftentimes the patient will develop an allergic reaction to his own skin irritation, and this may spread over the entire body. For this and the local condition, packs of Burow's solution diluted 1:10 with distilled water, give much relief. In the violently acute stage, boric or saline packs or colloidal tub baths help much. Later, X-ray treatments by the skin specialist and mild ointments are used. The support must be firm and constant when up and about, and nothing works better than the Unna paste boot or bandage.[18,8]

If ulcers have developed it is even more important that the support be firm and constant. Supportive Ace bandages, 4 inches wide, and the paste boots, together with the pumping effect of the calf muscles on walking rapidly many times a day, will rapidly heal the ulcers. The supportive care must be continued as long as there is edema in the tissues. Oftentimes the large, necrotic, and badly infected ulcers can best be cared for by putting the patient to bed for a few days with the leg in high elevation, by the application of hot wet packs, and then later, by a dermatome skin graft.[39] Supportive care must be used afterward for a long time and as long as there is edema present. As soon as the infection is under control and the granulations are clean, the scar tissue edges about the ulcer can be excised and a dermatome skin graft made to cover it all. Supportive care is very important when the patient gets up and about as long as there is any edema in the tissues. With these efforts any stasis ulcer or varicose ulcer can be healed and kept healed.

Intravenous Closure of the Deep Veins

[38,5,6,3,1]

The intravascular closure of the deep veins of the lower extremity may come on with such an insidious onset as not to be noticed at all (phlebothrombosis), or it may be accompanied with severe clinical symptoms, (thrombophlebitis).

By the term phlebothrombosis[38,1] we mean the simple closure of the vein lumen by an intravascular clot without the evidence of inflammation. This occurs more commonly in the individual at rest and sitting in the Fowlers position. This position causes a stasis of the venous circulation in the lower extremities. This stasis is prone to occur after trauma, operative procedures,[22,4] confinements, and in the presence of malignancies. The condition is seen more commonly in the winter and spring months.[20] The incidence is definitely higher in the obese.[30] Often its onset and presence is without symptoms and may not even be suspected until a fatal embolism has developed. This condition is more serious because its onset is so silent.

By the term thrombophlebitis we mean the intravascular closure of the vein lumen occurring secondary to and associated with an infection. Here we have the symptoms and signs of inflammation. The patient usually has a slight unexplained rise of fever. There may be and often is a tenderness deep through the calf and a positive Homans sign.[2,17] Usually the leg is swollen and this may be slight or extreme from toes to groin. If the swelling is extensive, the patient will usually complain of much pain. The color of the skin is usually cyanotic early but later may become white as the lymphatic blockage becomes more marked. Because of the inflammation the thrombus in the phlebitis case is usually anchored firmly and we get an embolus only as the thrombus may extend and then break loose. With the phlebothrombosis case the clot is not anchored and may loosen with the least activity and float upward forming an embolus. For this reason the phlebothrombosis case has potentially a higher mortality factor.[2,42]

The onset of thrombophlebitis stimulates a vasospasm of the vessels in the extremity. This becomes a vicious circle and if not relieved becomes chronic and leaves the patient with the large edmatous chronically swollen leg so commonly seen years after the presence of a phlebitis or "milk leg."

Treatment. The treatment of these two conditions must be considered under the prophylactic and active. The return of venous blood from the lower extremity is mainly aided by the negative intrathoracic pressure on deep breathing; the normal "vis a tergo" of the arterial pressure and flow; and the activity of the skeletal muscles. Do all possible to aid these factors. Urge deep breathing always. Have the maternity and postoperative case start elevation and bicycling from the very first. Have them out of bed and walking on the second to fifth day.[27] Avoid the use of the Fowler's position as much as possible. Avoid pillows under the knees with the lower legs hanging over them. This blocks the venous return at the popliteal area.

As soon as this condition is diagnosed, a lumbar sympathetic block [37] is done using 1 per cent novocaine and blocking the upper four lumbar sympathetic ganglia on the involved side. If the response is not complete, the block should be repeated in 24 to 48 hours, and again if necessary. Anticoagulant therapy is started at once. [24,25,29,21,3,4] Heparin 25,000 units is given on the first day. This is best given 5,000 units intravenously at three hour intervals, and repeated the next day if needed. Heparin, Pitkin Menstruum, Warner, may be given subcutaneously every 48 hours, 300 mg. Three hundred milligram dicumerol is also given on the first day, 200 mg. on the second day and 100 mg. on the third day. [6,29,25] The prothrombin time is then taken and repeated daily. It should be kept at 20 to 30 per cent of normal by giving 50 mg. to 100 mg. dicumerol daily as needed.

The more radical school of surgeons advocate the ligation of the deep femoral vein just below the profunda branch and many even advise the ligation of the external iliac vein.[1,2,16,42] If there is any question as to which side the phlebitis is on, they would ligate both sides. With this I cannot agree.[6,7]

At times this deep phlebitis has been so severe that it has destroyed the valves in the deep veins. When this is the case we no longer have the valves acting as a check on the downward or reverse flow of blood in the deep veins. Rather, we have a stagnant column of blood from the level of the heart downward having the full force of the effect of gravity acting on it all the time. In such cases the vein walls may become pervious to the serum in the vein and a stasis condition develops with swelling and edema of the lower legs. Supportive bandage may offset this for a time, but we often see complications develop in spite of it. In these cases it has been suggested [18,8] that a ligation of the superficial or deep femoral vein or even the iliac vein be done to replace, in a sense, the valve action and prevent the reverse flow. This ligation is very effective in such cases.

Arterial Disease of Extremity

There are four important arterial conditions to be considered: arterial embolism, which is acute, and the others, peripheral vascular sclerosis, Buerger's disease, and Raynaud's disease, which are chronic.

Arterial embolism or arterial occlusion in an extremity is an urgent emergency. The most important period is the first thirty-six hours. During this first thirty-six hours, the attending physician often follows a watchful waiting course and advises heat and elevation. This is the wrong thing to do. It has cost the loss of many extremities. During a period of observation for possible arterial occlusion, the extremity should be kept cool and placed in a position sloping downward from the hip so as to place the toes on a level with, or slightly below the hip. The blood in going past a partial obstruction, or, in going around that obstruction through collateral channels, loses pressure, and has a hard time reaching the foot and especially the toes. If that foot is elevated, the already diminished blood pressure may be unable to force the blood uphill to the toes, and gangrene results. If, on the other hand, the extremity slopes downward, gravity will help the blood reach the foot and toes.

The application of external heat raises the temperature and increases the metabolism of the tissues. Increased metabolism requires increased blood volume which the patient's inadequate vessels are unable to supply. On the other hand, partial refrigeration of the extremity lowers the temperature and decreases the metabolism of the tissues. Less blood is needed to maintain life in such tissues, and even an impaired system of blood vessels may be able to maintain viability until new vessels have developed. In other words, we have temporarily a very limited blood supply to an anatomical area which we wish to preserve until the blood supply can be improved. If we wish to preserve a piece of meat, we put it in the ice-box, not in an oven.

The collateral circulation can be improved by papaverine hydrochloride, grains ½ to 1½ i.v. q 4 h, and by lumbar blocks, repeated daily if necessary.

Etamon (tetraethylammonium chloride) has been used experimentally to aid the collateral arterial development. Its actual value in clinical use has not been proved.

Radio-opaque substances (diodrast and thorotrast) have been used to help locate the embolus. Their use is not without danger of mortality. I do not strongly advocate their use.

Embolectomy is a safer procedure now with the use of heparin and dicumeral than the old statistics would indicate.

Amputation, if necessary can be done in spite of sepsis, shock and poor general condition by using the tourniquet method of Maxeiner.[28]

Peripheral Vascular Sclerosis. This is not a rare condition. It occurs to some extent in perhaps 25 per cent of people over forty years of age. It becomes increasingly important as the average length of life increases. The typical patient is middle-aged to elderly, often with generalized arteriosclerosis, hypertension, or diabetes. Neither sex predominates. The first symptoms are crampy pains in the legs after walking a short distance. Later symptoms are rest pain, numbness of toes, cyanosis, tight, shiny skin, and other trophic disorders. Finally, ulceration and gangrene develop.

DeTakats four stages are helpful in selecting the type of treatment needed:

1. Patients who can walk from two to six blocks before developing a pain or cramp in the lower legs. These cases have no trophic changes. They should limit their activity, protect their extremities from injury, sudden changes of temperature, and avoid emotional stress as much as possible. Passive vascular exercises or Sander's oscillating bed will stimulate development of new blood vessels. These patients are usually most comfortable in a position with the leg sloping down and toes not above the level of the hips. Alcohol in small amounts acts as a vasodilator and may be beneficial, but smoking is detrimental. Certainly it should be completely discontinued for a trial period of several months to a year.

2. Patients with claudication on walking less than two blocks. The mild atrophy of the extremity and the shiny, tight skin are trophic changes. Rest pain, especially at night, is disturbing. More intensive treatment must be given this group. Lumbar sympathectomy should be considered. A lumbar sympathetic block should be made as a test. If this trial gives temporarily (1) increased skin temperature of the extremity, (2) greater walking distance before claudication, and (3) a decrease of the venous filling time, a lumbar sympathectomy is indicated if the patients are otherwise in good surgical condition.

Medical measures, in addition to those already mentioned, include meticulous care of the feet with energetic action against any skin infection. Vasodilating drugs, such as tetrithione 0.6 gm., intravenously, daily at first and later two or three times weekly, may give considerable benefit.[9] Padutin, given orally or hypodermically, has much the same effect. Nicotinic acid, 50 to 100 mg. tablets, is given, one tablet t.i.d. or q.i.d. Aminophylline has a vasodilating action in the extremities and is used especially if coronary disease is present or suspected. The use of ether, properly diluted, intravenously, ascorbic acid and etamon, and other substances is in a preliminary trial period.[9]

3. Patients with intractable night pain: This is due to an ischemic neuritis. They often get no relief from morphine, but show dramatic improvement from a lumbar block. At this stage of peripheral vascular sclerosis there are marked trophic changes: atrophic shiny skin, dependent cyanosis, pallor on elevation, osteoporosis, etc. Sympathectomy is the treatment of choice if age and other factors permit: it will have no effect on the organic changes already present, but will permanently paralyze the constrictor power of the vessels so that those vessels still capable of size alteration will be permanently dilated regardless of cold weather, leg position, or emotional stress.

4. Patients with ulceration and gangrene: Amputation is usually necessary but it can be done at a lower level if penicillin is used to control the infection and sympathectomy performed to improve the circulation in the tissues that are still viable.[2,3]

Buerger's Disease. The differential diagnosis between Buerger's disease and peripheral vascular sclerosis is often difficult, but such differentiation is often purely academic because in both conditions the treatment is essentially the same. If the patient has or has had a migrating superficial phlebitis, the tentative diagnosis must be Buerger's disease. Other helpful distinctions are that Buerger's disease occurs mostly in males, and has its onset at 25 to 50 years of age rather than in the older arteriosclerotic group. Buerger's disease is an inflammatory process that has periods of activity and inactivity.

A lumbar sympathectomy will in no way affect the primary process but during a period of inactivity it will relieve the ischemic pain, improve the circulation, etc., just as it does for peripheral vascular sclerosis.[4] Smoking must be positively forbidden, foci of infection removed, and emotional upsets controlled. Pain, the most important symptom, is of two types (1) *rest pain,* limited to the toes or fingers in 95 per cent of the cases, and often severe before there is any sign of gangrene. Conversely, in an occasional case, frank gangrene may occur without any rest pain. (2) *Claudication,* or pain after exercise and relieved by rest. This type is due chiefly to anoxemia. In the mild or early case, it may amount only to abnormal fatigue and weakness. It occurs chiefly in arch of foot or on inner calf of leg bearing body weight, thus alternating from one leg to the other as the patient walks. It disappears almost immediately with rest, but soreness and fatigue persist. Many cases are mistakenly called rheumatism; others metatarsalgia, or fallen arches. Amazing cases are on record showing as many as thirty varieties of special shoes and arch supports being prescribed by the physicians for a single patient with typical claudication pain in the feet, but no detectable abnormality of the arches.

Raynaud's Disease. This is a vasospastic phenomenon involving the distal parts of both the upper and lower extremities. It is of unknown etiology and seldom seen. The pathology seems to be simply an overstimulation of the muscles of the arterial walls that they contract and thus narrow the lumen or even close the vessel entirely. Only the tips of the digits may become involved or it may involve an entire hand or foot. It is usually bilateral and more often affects the hands than the feet. It is seen more often in females than males (8 to 1).

A differentiation of the presence of Raynaud's disease[17] and the mere presence of the Raynaud's phenomenon must be made. The onset of the vascular disturbance may be brought about by many things and conditions. It is only when we see a patient, most often a female, under fifty years of age, with vascular disturbances of the digits, bilateral, that go through a typical color change sequence and for which no definite cause can be found, that we can make a diagnosis of Raynaud's disease. The changes may be mild or severe.

The color changes are marked signs. Following exposure to cold, the involved areas become blanched white, then following warming, the skin becomes cyanotic and mottled and then a deep cherry red as the spasm relaxes and a good arterial flow is established again. Between the attacks the parts are usually warm, and moist. There is seldom any pain or swelling present. Ulceration and gangrene are present only in the later stages. The vasospastic condition is stimulated mostly by exposure to cold. Excitement, anger, or great fear may be the exciting factor.

The prognosis for the mild case is good but the more severe cases may progress to gangrene in spite of all care. All exciting factors must be carefully avoided. If the case is progressive in spite of this care then a sympathectomy for the area involved will usually give complete and permanent relief.

Lymphœdema of the lower extremity. This is most commonly seen in cases of deep femoroiliac thrombophlebitis such as occurs postpartum and postoperative, and has been previously discussed.

Another type occurs with an insidious onset but is progressive. No cause can be found for this case. It is termed lymphœdema præcox or simplex of Barker and simply means a lymphœdema of unknown cause.[12,3]

Then there is also the lymphœdema secondary to a sarcoma of the lymph glands in the inguinal region and along the iliac vessels. This usually is of slow onset, but two cases have been seen with a typical acute onset which later were proved with biopsy. One responded somewhat to deep X-ray therapy and lumbar blocks. The other is now under active X-ray treatment.

Regardless of the cause, everything possible should be done to aid these unfortunate individuals. No longer should we sit placidly by and tell the patients that they simply have a "milk leg" and that nothing can be done. On the contrary, these cases demand emergency care and treatment just the same as does the acute appendix. Although they may not die from an embolus they often do develop leg complications that plague them the rest of their lives and which might be prevented with prompt and appropriate treatment.

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NEW TEACHING FILM AVAILABLE

The American College of Surgeons takes pleasure in announcing the completion of a new teaching film "Anomalies of the Bile Ducts and Blood Vessels: Strictures of the Common Duct" which was shown at the 1947 Sectional Meetings and Clinical Congress of the American College of Surgeons and the Centennial Meeting of the American Medical Association. This film is now available for loan or purchase and is the first in the series of teaching films being produced under the expanded motion picture program.

The picture was directed by Warren H. Cole, M.D., Professor of Surgery and Head of the Department, University of Illinois School of Medicine, with the cooperation of an advisory committee. Production was made possible through a grant from the Johnson & Johnson Research Foundation.

The method of presentation used in this film is somewhat different from that commonly utilized. Drawings with animation were employed inasmuch as operations for repair of stricture of the bile ducts are so numerous and also are so complicated that actual photography in an operating room was not considered practical. A pamphlet which summarizes the material covered in the film is available upon request for each showing of the film. The motion picture is 1200 feet long (40 minutes), silent, and in color. Inquiries may be directed to: Ethicon Suture Laboratories Division of Johnson & Johnson, New Brunswick, New Jersey.

The Student Health Service in the Massachusetts Institute of Technology*

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The development of student health service in colleges has been of comparatively recent origin, for up until about twenty-five years ago most colleges maintained a very small staff of physicians and attended to minor medical matters only. If any illness called for more than routine medication or advice, the student went to a private physician or more often received no treatment. During the last quarter century, however, there has been a growing interest in the field of student health until now most colleges assume that the health of their students is of as much importance as the development of their intellect.

Providing students with clinical treatment and hospital care is a worthy and necessary part of a student health service, but not the most important one. A vigorous student health department should be an educational unit with a staff organized to show the students and the community how to use medical care efficiency and wisely, so that the graduating students may become leaders in their communities in efforts to maintain well-organized public health services, effective sanitation and a wide distribution of modern medical treatment facilities.

The Medical Department at M. I. T. began in 1907, but for several years its scope was very limited, being confined mainly to routine first aid. Its growth in recent years may be visualized by comparison of the statistics of the years 1913-14 and 1946-47. The enrollment in 1913 was 1600. In 1913-14, the Institute physician maintained office hours from 4 to 5 o'clock on Mondays and Thursdays. During that year he saw 244 students for a total of 562 consultations. He spent a total number of 62 hours in the Clinic. In contrast in 1946-47, the Medical Department had a total of 42,488 calls. The staff is now made up of the Director, who is employed on a full-time basis, and about twenty other physicians, who work from two to eighteen hours a week each in the various clinics. This amounts to about the same as six doctors working on a full-time basis. Not only has the extent of the medical attention changed during these years, but the whole conception of the care of the students at M. I. T. has become elevated. The completion of a new thirty-five bed hospital, The Homberg Memorial Infirmary, in 1928 and its remodeling in 1944 have furnished the setting for much of this growth.

The Medical Department at the Institute differs somewhat from most student health departments in that faculty members and employees are eligible for treatment on the same basis as students. This situation has existed since 1919, and in this community it has been quite satisfactory. At present there are about 9,000 persons eligible for medical treatment in the Department.

At the present time the department interest in a student of M. I. T. begins before he enrolls at the Institute. A form is sent to the student to be filled out by his family physician which calls for certain pertinent information about the student which will be of use to the Medical Department in caring for his health needs while in residence at the Institute. From this form we learn whom to notify in case of serious illness as well as the medical history of the student and his family. We learn whether or not he has had any nervous illness, whether he is subject to fainting attacks and if he is sensitive to any drugs. The family physician is asked if, in his opinion, the student may safely participate in athletic activities. With this information, the possibility of inadvertent injury to the student's health during the first few days or weeks of college is minimized.

After he comes to the Institute, the student reports to the Medical Department for an appointment for a physical examination. At this time he is asked to fill out a more detailed form, giving his own version of his past medical history, health habits and his military history, if any. Then the examining physician checks him thoroughly, requests any indicated laboratory procedures and determines what athletic activities he may be allowed to engage in safely. He then goes to the Dental Service where a checkup of his teeth is made and appropriate X-rays taken. An X-ray of his chest completes the examination. Thus, within a very few days or weeks after he is admitted to the Institute, the Medical Department has a fund of information about each student's health, which enables it to be of greatest usefulness to the patient in case of subsequent illness. All the accumulated records of each student are kept in a folder which is brought from the files each time a student visits the Medical Department and is made available to the doctor at the beginning of the consultation. Although this is sometimes a useless procedure for very minor injuries or illnesses, yet it does help prevent unnecessary mistakes on the part of the physician. In case the student needs to be admitted to the Infirmary, then his record is transferred to the Infirmary for the benefit of the visiting physician there.

During the remainder of the student's career at M. I. T. he receives an X-ray of the chest, a physical examination, or both, each year.

When a student becomes ill and reports to the Medical Department, he is usually seen first by an internist or a surgeon. If he asks to seen a psychiatrist, he is given an appointment directly, but in general it is the

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*This article is a slightly revised version of one first published in *Technology Review*, Vol. 49, No. 8, page 459, June 1947. Reprinted by permission, "so that members of the American Student Health Association might have a description of a typical successful Student Health Service setup."—George T. Blydenburgh, M.D., Secretary-Treasurer, A.S.H.A.

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policy to have the patient first checked by a physician who is not a specialist. If specialized attention is needed, then a student can be referred to the Laboratory, to the X-ray Department, or to special clinics in ophthalmology, otolaryngology, dermatology, neurology, psychiatry, or occupational medicine.

Because of the number of research projects involving hazardous materials, both of a chemical and radioactive nature, the Department has recently added two consultants in occupational medicine to its staff. These physicians act in a cooperative and consultative capacity with heads of departments and project supervisors throughout the Institute. They conduct inspections of an informal nature in the effort to locate and eliminate avoidable hazards and aid in the dissemination of adequate preventive health measures. When indicated, they work in cooperation with the Safety Council of the Institute, but at other times their work is purely of a medical nature.

Because of the proximity of excellent Boston and Cambridge hospitals the Medical Department does not maintain a complete operating room for major surgical operations. If an appendectomy or other major operation is necessary, the patient is transferred to the hospital of his own choice, where he may also choose his own surgeon if he so desires. In most instances, however, the student is not familiar with surgical facilities or with the skill of the various surgeons, and as a result he abides by the judgment of the Institute physicians. After his operation has been performed and he is able to be transferred, he is then returned to the Infirmary for convalescence.

When any student contracts a contagious disease such as measles, mumps, or chicken-pox he is transferred to the Haynes Memorial Hospital in Brighton, the local hospital for communicable diseases.

The Institute has just completed an arrangement with the Massachusetts General Hospital whereby M. I. T. students may be admitted on an emergency basis to the surgical or medical wards of that hospital and receive adequate care regardless of the financial status of the patient. Thus the parents of any student of the Institute may be assured that modern and skillful treatment is available for their son or daughter as long as he or she is enrolled at the Institute.

HOSPITAL CARE

The second and third floors of the Homberg Memorial Building contain thirty-three beds for the hospital care of students, faculty members and employees. During the past two years this number of beds has been adequate, chiefly due to the fact that no epidemic occurred during that period. In the event of an epidemic of any sort, emergency facilities are available in nearby rooms ordinarily used by other departments of the Institute.

On the second floor of the Infirmary, which was newly renovated in 1945, there are nineteen beds, two of which are in private rooms, two in a two-bed ward, three in another ward and six in each of two others. The arrangement in the large wards is such that the nurse on duty can maintain very close supervision over all the patients by means of an ingenious architectural arrangement whereby windows from the nurse's station permit visibility to both of them. The kitchen and dining rooms for the nurses and employees are also located on this floor.

The third floor contains two wards with a total of nine beds and five private rooms. In addition there is an operating and sterilizing room, various utility rooms and an apartment for the chief nurse. On the roof is a solarium which can house from two to four beds in emergencies, but which is usually used by convalescent patients.

When the clinic on the first floor is closed, first aid and emergency treatment is always available on the third floor. A physician is either in residence or on call at any time day or night throughout the year.

KALES CLINIC

In 1946 the Kales Clinic for the diagnosis of diseases of the eye was established by Mrs. William R. Kales in memory of her husband who was formerly a very valuable and interested member of the Department's visiting committee. In this clinic the ophthalmologist has the most modern diagnostic equipment available, and ever since its establishment it has been one of the department's most popular and useful clinics. There were 791 consultations during the 1946-47 season. Early in 1947 this clinic was enlarged to include the otolaryngological service, thus greatly extending its usefulness.

THE DENTAL SERVICE

Ever since its establishment by a grant from the Charles Hayden Foundation in 1940, the Dental Service has formed an invaluable part of the Institute health facilities. A dentist holds a clinic for one hour each day and two dental hygienists give full time duty. Some indication of the scope of their work may be learned from the fact that during the last school year there were 5,160 visits for examination and treatment, and 1,496 X-rays were taken. Only diagnostic, emergency and prophylactic work is done in the clinic; if complicated mechanical treatment is needed, the student is referred to a private dentist.

PSYCHIATRIC SERVICE

From the administrative standpoint it is convenient to think of the student in an abstract way and to assume that he should enroll in college and attempt to do the work required of him. If he is unable to pass his courses, then he should be dropped and someone else admitted to take his place. In fact, some administrators have expressed the idea that a good admissions officer can eliminate psychiatric problems by the simple expedient of not admitting potential neurotics. This concept overlooks the fact that every person is a potential neurotic and that whether or not disabling symptoms ever occur depends on a large number of variable circumstances. Experience with combat casualties during World War II convinced the writer that every man has his breaking point — that up to a certain point a person performs his duties in a satisfactory, highly integrated manner, but when the strain becomes too great the formerly well adapted individual "goes to pieces" and is greatly handicapped by a multiplicity of symptoms. The sources of strain are usually numerous and varied and cumulative in action; the symptoms are apt to be abrupt and dramatic, and frequently appear to be brought about by a trivial occurrence.

The more highly skilled and sensitive a person is, the more vulnerable he is to factors of stress and strain in his environment. Successful training and the acquisition of skills and habits in a specialized field tend to counteract the tendencies toward neurotic behavior. The student, however, is frequently bewildered and perplexed by the numerous demands made on him before he has made a mature adjustment and may respond to them in a highly inappropriate manner. Hence the physician who is interested in emotional problems has the most favorable opportunity of any life period when he attempts to aid the college student in the solution of his problem.

Students at M. I. T. have problems confronting them which are very similar to those of college students everywhere in the United States. Some have to contend with insecurity at home because their parents are separated or display open hostility toward each other. Others feel hopeless in the attempt to make a record as good as that of a brilliant father. An occasional student has difficulty in reconciling his religious beliefs and the scientific facts that he has learned. Sex problems interfere with the efficiency of some students. A brilliant student may develop faulty study habits early in his college career, acquire a false sense of security because of the ease with which he secured good grades his first year, only to find later on that he has reached a crisis—is about to fail—all because he is unable to think through his problem alone. The influx of married students has brought the usual quota of domestic disharmony, especially since many couples are trying to adjust to each other under conditions which are trying at best. All these and many other types of problems are tackled by the psychiatric staff of the Medical Department with the idea in mind that it is much more worth-while to help an already highly skilled student make a better adjustment than ruthlessly to cast him aside and make way for a person who has not yet developed any symptoms. Over a twelve year period the writer has seen enough successes in psychiatric treatment of college students to warrant the conclusion that this work is of vital importance in any student health organization. It is essentially psychiatry for the normal person, and as such is of great educational significance for the whole college community as well as for any individual.

Cooperation with Dean's Office

There is a close working relationship between the Medical Department and the Dean's Office, since many problems that students present must be worked out jointly by the two offices. The Dean of Students is a member of the Medical Department and as such attends staff meetings and is always aware of the policies and procedures of the medical staff. Care is taken, however, to see that the privacy of the student is not violated, and all medical facts are held in strict confidence. In no sense is the Medical Department a participant in passing on to the Dean's Office information about a student which might prove embarrassing to him. To do so would be a violation of the traditional confidence which is an essential part of the physician-patient relationship and would seriously limit the usefulness of the Medical Department in various ways.

Practically all cases of low scholarship are reviewed by the Medical Department before final recommendations are made by the Dean to the faculty in order that remedial measures may be taken if any health factor is present.

In the broad field of student morale and the promotion of mental health the deans and physicians are frequently quite dependent on one another. Very frequently disciplinary problems turn out upon investigation to be largely in the emotional field and hence require medical skill for their solution. Likewise, numerous strictly medical situations can be handled only by the sympathetic understanding and cooperation of the deans. The whole philosophy of the two departments, both in theory and practice, is one of complete cooperation in all matters affecting the welfare of students.

Health Supervision of Athletes

In addition to performing a complete physical examination on each student before he is allowed to participate in any athletic contest, a physician is present at all regularly-scheduled athletic events. This physician, either directly or through the trainer, has the entire responsibility for determining whether a student is able to play or not and of course takes no chance of injuring a student's health. All injuries treated in the Clinic which have been incurred in athletic activity are reported at weekly intervals to the Athletic Department, giving the coaches and others interested data which may be of use in determining the basic physical condition of the men out for various squads.

There is a close working relationship between the Athletic and Medical departments. Before a student is permitted to participate in any form of athletics, intramural or intercollegiate, his physical capabilities are reviewed by the Assistant Medical Director and a letter is sent to the Director of Athletics, informing him of the sports in which the student may participate. If he needs remedial exercises, the letter includes a prescription to guide the physical instructor. The range of sport activities sponsored by the Athletic Department is so wide that practically every student can participate in some recreational activity.

The Medical Director serves on the Athletic Administrative Board, thus giving the Medical Department a voice in formulating over-all athletic policies. The trainer is under the supervision of the Medical Department. A physician is in attendance at every intercollegiate athletic competition, and another is always available during hours when practice sessions are being conducted. The physician in attendance has absolute power to decide whether a student is able to play or not.

PREVENTIVE MEDICINE

An important part of the Department's activities is the prevention of disease in every possible manner. One of the requirements for admission is that the prospective student be immunized against typhoid and small-pox. These and other immunization procedures are constantly being done by our staff. Institute personnel planning travel to other sections of the country or to foreign countries consult the department for information concerning health conditions there.

In April 1947, the Massachusetts State Department of Health set up a mobile 70 mm. chest X-ray unit in the Institute, and 4100 X-rays were made. Out of this number, five unsuspected clinical cases of pulmonary tuberculosis were discovered and treatment procedures instituted. As the result of this preliminary survey the Medical Department has obtained a 70 mm. chest X-ray outfit, and it is now required of every student in the Institute that he have a chest film at least once a year. A program of tuberculin testing is too cumbersome and time-consuming to be practicable in a school of this size with funds and facilities that are available at present.

The Medical Director is a member of the Safety Council of the Institute, which has as its main function the elimination of any situations or circumstances which threaten the health and safety of Institute personnel.

Although the Department does not have the facilities to care for the members of the families of students, faculty or employees, it does stand ready to act in an advisory capacity in such matters as choosing a physician, gaining admission to hospitals and in furnishing directory service for those who need to consult specialists in other sections of the country.

The Medical Department is financed from general Institute funds. In order to supplement the amount of money available and increase the services rendered by the Department, a charge is made for some special services. Residence in the Infirmary costs the student from $2.00 to $3.00 per day, and X-rays, unusual laboratory procedures, electrocardiograms, eye refractions, and consultations by the dermatologist and otolaryngologist are at the expense of the student though at much lower rates than are paid by the community. Whenever a student is transferred to another hospital for major surgery or for the care of communicable diseases, he is responsible for all expenses incurred; likewise if a consultant is needed, his fee must be borne by the student or his family. In no instance, however, is a service denied to a student because of lack of funds. A needy student fund is also available from which a student may borrow money for unusual medical expenses.

In many colleges formal courses in hygiene are given to freshmen. At the present time the Department is not convinced that the good accomplished in such courses is sufficient to compensate for the amount of time required in an already overcrowded schedule. A health program can probably be furthered most effectively by prompt and thorough attention to the individual whenever he is threatened or in trouble.

The aim of the Medical Department is to diagnose and treat the illnesses that occur in the Institute family, to prevent disease in any manner possible, to act in a medical advisory capacity in a wide range of health and personal problems, and to be an educational center for the Institute so far as health matters are concerned. To carry out these aims a staff has been assembled which cooperates in much the same manner as would a group clinic under private auspices. The staff endeavors to carry out its work in a personal, quiet and dignified manner with the highest of professional standards in mind. By so doing, the Department hopes to earn its right to vigorous support and cooperation from all members of the Institute.

E. STARR JUDD LECTURE

The fifteenth E. Starr Judd lecture will be given by Dr. Alfred W. Adson, Professor of Neurosurgery at the Mayo Foundation, Thursday evening, April 29, 1948, at 8:15 in the Auditorium of the Museum of Natural History. Dr. Adson's subject is "The Evolution of Neurosurgery."

The late E. Starr Judd, an alumnus of the Medical School of the University of Minnesota, established this annual lectureship in Surgery a few years before his death.

Parenteral Nutrition

Pre- and Postoperative Use of Glucose, Amino Acids and Alcohol

(A Preliminary Study)*

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Glucose has been used for many years as a supportive measure to prevent shock and to provide additional carbohydrate in order to protect the glycogen reserve in the liver, and thereby provide energy for glycogen metabolism. Glycogen also plays an important role in the synthesis of certain amino acids as well as for the utilization of fat.

Saline, or Ringer solution, provides electrolytes, the values of which, when properly administered, are well known.

Elman has shown the value of amino acids in maintaining nitrogen balance, without which nitrogen metabolism is continued at the expense of other tissues, principally muscles.

A casual discussion with regard to the use of alcohol for its therapeutic value has repeatedly brought about the remark that it would be served best with a cherry. Religious or moral objections to its use have been counteracted by suggesting that its chemical formula does not spell "sin."

The abuses of alcohol, when taken internally, have probably exceeded its uses, by far, despite the fact that innumerable hours of charm have been attributable to its physiological action.

Despite the inevitable witticisms which are produced when the therapeutic effect of alcohol is discussed, this drug has a value which seems to have been comparatively overlooked.

Alcohol provides approximately seven calories of energy per gram. These calories cannot be stored, but can be utilized as energy when energy cannot be provided by mouth. Higgins has shown that alcohol will be utilized for energy in place of sugar when the two are provided together. Moore and Kalp emphasize the caloric value of intravenous alcohol in cases suffering from inanition. A number of other authors have mentioned these values, but still its use has not become extensive.

Alcohol produces sedation and analgesia and has been used for this purpose in conjunction with saline or glucose in order to reduce the need for morphine. Bieter has mentioned that pain reaction is more satisfactorily relieved with alcohol and aspirin than with many other drugs.

Mellandy mentions that alcohol increases the depth and rate of respiration by bringing about a greater carbon dioxide tension in the lungs. To this extent, postoperative pulmonary complications should be diminished.

A review of the literature fails to disclose the use of a combination of all three of these products simultaneously. This study is being undertaken with the thought in mind of providing most of the essential metabolic requirements to the patients who, because of illness or disease, are unable to receive these by the gastro-intestinal route. Studies are being made relative to nitrogen balance, respiratory quotients, blood and urinary alcohol levels, and other factors, in an effort to prove the efficacy of this type of intravenous alimentation.

Nutritional Requirements

The proper daily food proportions expressed by Best and Taylor have been mentioned as consisting of 48 per cent carbohydrate, 40 per cent fat and 12 per cent protein.

In order to maintain a diet of 2500 calories, it would, therefore, be necessary to provide:

glucose	300 grams	— 1200 calories,
protein	75 grams	— 300 calories,
fat	110 grams	— 990 calories,
Total		— 2490 calories.

During periods of tissue repair, as in the postoperative convalescent patient, it has been shown that healing occurs more rapidly if a high protein intake can be maintained. It is, therefore, logical to increase the protein intake during any period of convalescence. We have endeavored to do this, as suggested in a subsequent paragraph, by increasing the daily protein intake to at least 100-150 grams. Vitamin C has also been shown by numerous investigators to contribute beneficially to wound healing. The vitamin B complex factors are known to be essential for the proper metabolism of various amino acids.

Fats have been given intravenously, but have not been proven to be entirely suitable for intravenous alimentation, and are at this time impractical. The principal function of fat is to provide a source of energy without which energy will be taken from the less dispensable stores of protein and glycogen. Though fat can be synthesized in the body from carbohydrate and protein, it is not a physiologically economical method for obtaining the necessary energy. Until fat can be satisfactorily utilized intravenously, another source of caloric energy must be provided.

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*This study is being undertaken at the St. Barnabas Hospital as part of the teaching program for Surgical Fellows, Residents and Interns.

**Surgical Fellow, University of Minnesota, assigned to the St. Barnabas Hospital, Minneapolis.

***Surgical Resident, St. Barnabas Hospital, Minneapolis.

Energy can be provided by alcohol. It is promptly metabolized. Alcohol cannot be stored as a reserve.

The problem, in the patient who cannot obtain his nutrition through the gastro-intestinal route, is to provide sufficient energy (calories), along with the essential carbohydrates, proteins, electrolytes and vitamins, to adequately protect him until he can utilize food through the gastro-intestinal route.

For the average adult individual who is unable to take anything by mouth, we have established the following daily requirements and have administered these intravenously to our postoperative patients. These essentials may vary in accordance with the needs.

Vitamin B complex and Vitamin C
Fluids 3,000 cc.
Sodium chloride 6-18 grams
Carbohydrates (glucose) 150-180 grams—600-720 calories
Protein (amino acids) 100-150 grams—400-600 calories
Alcohol 120-180 cc.—960-1080 calories
Total—2,020-2,400 calories.

It has been repeatedly mentioned in the medical literature that the difficulty of providing nutrition parenterally by the use of intravenous solutions has been that of obtaining sufficient calories without too much fluid, or, over a long period of time without producing thrombosis of the veins.

It has impressed us that if alcohol, with a caloric value of 7 per gram, could be substituted for fat and used in conjunction with glucose and a protein digest, from each of which the caloric value is approximately 4 per gram, the daily requirement could be obtained without exceeding the normal fluid intake in twenty-four hours.

CLINICAL OBSERVATIONS

Accordingly, a solution of 5 per cent glucose, 5 per cent amigen and 30 cc. of 95 per cent alcohol, prepared to a volume of 500 cc., was injected quite rapidly into a dog without harmful effects.

Thereafter, a poorly nourished, emaciated, dehydrated man, age 83, suffering from an inoperable completely obstructing carcinoma of the stomach, was given intravenously 3,000 cc. of this solution daily for ten days. Because of the inevitably fatal outcome incident to his disease, intravenous infusions were then discontinued. No harmful effects were observed from the intravenous alimentation in this man. During the period of the studies, nitrogen balance was maintained and the plasma protein rose from 4.5 per cent to 6.6 per cent. Three blood transfusions contributed to this rise of plasma protein. He lost 2.1 kg. of his body weight.

We were impressed with the absence of harmful reactions, the ability to obtain sedation, and the possibility of providing adequate nutrition for patients during periods of time in which nutrition cannot be given by mouth. Accordingly, other patients have been given glucose, amino acids and alcohol pre- and postoperatively over varying periods of time.

To date we have used this preparation in more than 300 patients without harmful effects. More than 1000 liters of this solution have been injected. It is now being used routinely in our postoperative patients when, for the first twenty-four hours (occasionally forty-eight hours), the patient is not permitted to take nourishment by mouth. We have used it preoperatively in patients who have been unable to eat or retain food; or to supplement oral feedings when these have not provided sufficient calories. Twelve patients have received each more than 20 liters of this solution during a pre- and postoperative period of observation.

Mr. O. H., age 58, suffering from extensive carcinoma of the transverse colon, gained 3.4 kilograms in seven preoperative days when 3000 cc. (2280 calories) of this mixture were supplemented with his oral feedings, which could not be forced beyond an average of 1400 calories. An average daily nitrogen balance of 17.2 grams was obtained over this period of time.

In three patients whose blood-urea-nitrogen were determined each four days and who received 3000 cc. of this preparation for ten days or more, no harmful effects were observed. The blood-urea-nitrogen studies revealed no elevation over this period of time. These patients remained in strong, positive nitrogen balance.

Mrs. A. S., age 52, suffering from carcinoma of the sigmoid, was placed on nitrogen balance studies pre- and postoperatively with variations in the caloric and nitrogen intake at each four-day interval (see table). Caloric and nutritional intake was altered in each four-day period with the parenteral use of glucose, amino acids and alcohol.

The caloric value of the protein content of the food varied from 13 to 20 per cent of the total caloric intake as indicated in the table.

On the basis of these studies, it is indicated that a negative nitrogen balance was obtained when insufficient calories were provided as in Period III. In Period IV where the same percentage of calories were derived from protein, though the total calories were increased, a positive nitrogen balance was obtained.

In Period V the total calories were increased with the use of glucose and alcohol, but the percentage of protein was decreased to 13 per cent. In this period, there was a still greater positive balance and less excretion of urinary nitrogen, indicating economy of nitrogen when the caloric intake is increased.

Period II, with a very nearly similar caloric intake as in Period V but with a larger percentage of protein, suggests the greatest economy of nitrogen, in that the nitrogen excretion was only slightly greater than in Period V, though the nitrogen balance was considerably increased.

The analysis of other protocols dealing with nitrogen balance studies suggests that though the nitrogen intake is increased, both in grams and in relative percentage of the total calories, it is difficult to maintain a strongly

Table. Nitrogen Balance Studies of Mrs. A. S.

	4 da.	8** da.	12 da.	16 da.	20 da.
	Period I	Period II	Period III	Period IV	Period V
Total Average Daily Caloric Intake	2084 C	2830 C	1587 C	1941 C	2918 C
Average daily N_2 Intake	17.2 gm.	20.4 gm.	9.5 gm.	11.5 gm.	15.17 gm.
Percent of Total Calories Derived from Protein	20.5%	18%	14.9%	14.8%	13%
Average Daily N_2 Output (Urinary)	6.86 gm.	3.5 gm.	14.8 gm.	7.2 gm.	2.9 gm.
Average Daily N_2 Balance	+10.34 gm.	+16.9 gm.	—5.4 gm.	+6.3 gm.	+12.3 gm.
Weight	59.25 kg.	59 kg.		58.2 kg.	57.5 kg.
Plasma Protein	6.2 gm.%	5.8 gm.%	5.6 gm.%	5.1 gm.%	5.6 gm.%
Hemoglobin	72%	98%*	90%	80%	87%
Hematocrit		45%	43%	41%	41%
Average Temperature	100.5°	100.8°	100°	99.6°	99.8°
Blood-Urea-Nitrogen	5 mg.%	11 mg.%	10 mg.%	7 mg.%	7 mg.%

*1500 cc. of blood given in Period I contributed to this elevation of hemoglobin.
**Resection of the sigmoid and primary anastomosis was done on this day.

positive nitrogen balance without providing additional calories to protect these.*

Further studies are being continued in an effort to determine at what point the greatest economy of nitrogen can be obtained.

We have observed no thrombophlebitis in any of our cases when the period of intravenous administration was not continued over a long period of time. A few instances have occurred when intravenous infusions have been given daily for a week or more. The thrombophlebitis is comparable to those produced from the injection treatment of varicose veins.

A few cases in which perivenous leakage took place developed temporary mild swelling and redness. No slough has been produced.

A flushing of the face and body was produced in a few cases when the rate of administration was too fast. This finding was not alarming and no temperature reaction nor chill was produced.

From our studies it appears that alcohol has a beneficial effect upon the motility of the gastro-intestinal tract and bladder. Gas pains were diminished and the need for postoperative catheterization reduced. The need for morphine has been almost completely eliminated. Another study has definitely convinced us that morphine has so many undesirable side effects that its beneficial value for the relief of pain is far outweighed by its bad effects, especially when it is possible to obtain the desired analgesic effect with alcohol, or alcohol and sodium salicylate.

For a short period of time a number of pyrogenic reactions were observed, but these were completely eliminated after disposable tubing was used.

If the rate of infusion is too rapid, the symptoms of alcohol intoxication may be observed. The effect of alcohol is first manifest by sedation, dozing and light sleeping. If the rate of infusion is increased, symptoms of restlessness appear, and if the rapid rate persists, the patient becomes confused, speaks indistinctly and acts intoxicated. These symptoms disappear within a short time after the infusion has been discontinued. No "hangover" symptoms have been detected.

Occasionally slight nausea is a complaint, presumably from the amino acid when the rate of administration is too rapid; these symptoms disappear when the rate is again slowed. It is important that the rate of administration does not exceed the stage of sedation lest these undesirable effects become evident.

If the alcohol level in the blood is raised to the point where sedation is obtained, further medication is rarely required. The need for narcotics has been almost completely eliminated.

Patients may feel soreness in the abdomen after operation, as is to be expected, or may occasionally describe this as a sensation of "feeling gassy," but rarely require a "hypo" when asked if they feel the need for one. Gas pain colic is rarely observed.

The beneficial effects are remarkable in that the patient does not experience the exhausted, lethargic sensation so commonly evident in one who has been starved completely for twenty-four or forty-eight hours.

Preparation of Solutions

These solutions are prepared by using the commercial aminisol 5 per cent, glucose 5 per cent in 1000 cc. of distilled water; 60 cc. of 95 per cent alcohol is injected through the rubber stopper directly into the aminisol solution. It is then thoroughly shaken. Aminisol is used when the greater percentage of available protein is desired. With this solution 1000 cc. of the preparation provide 750 calories.

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*Further studies are being made in this regard.

The alcohol may also be mixed with the commercial amigen-glucose solution, the sodium chloride content of which is 2 grams per liter. Only 710 calories are provided when amigen is used because of the lesser quantity of available protein in the amigen. It has the advantage, however, of providing 2 grams of sodium chloride in each liter.

TECHNIC OF ADMINISTRATION

One ampule of vitamin B complex and vitamin C is given each day when food is not taken by mouth. The vitamin B and C is injected through the rubber tubing after the infusion has started.

The technic of giving the glucose, amino-acids and alcohol seems of importance lest the rate of infusion will not produce the desired effect. When used postoperatively wherein the sedative effect of alcohol is desired, in addition to its caloric value, the infusion is started fifteen minutes postoperatively and the first 200 cc. is run in in about twenty or twenty-five minutes. This, we believe, increases the alcohol level slightly above its rate of metabolism. (Studies are being made with this in mind in an effort to determine the optimum level for sedation, the optimum level of alcohol for complete metabolism and the level at which undesirable symptoms develop.)

Thereafter, the rate of drip is slowed up so that the balance of the solution is run in in about three and one-half hours. The bottle is marked and the rate of drip frequently observed in order that the infusion will be administered as uniformly as possible. The administration of 1000 cc. of solution requires between three and one-half to four hours.

A vein on the forearm or leg is used in preference to the antecubital vein in order that the patient can bend the elbow and move the arm without piercing the needle through the vein. Mobility in bed is not restricted and therefore a four-hour period of intravenous infusion does not become tiresome.

The routine postoperative patient receives 1000 cc. of this mixture immediately after returning from the operating room. He will usually sleep or doze until late afternoon (five or six hours after operation). A second liter is again administered in the evening, thereby promoting sedation throughout the major portion of the night.

When these infusions are used solely for their nutritive value, the full four-hour period is consumed in the administration. Sedation is not required in the preoperative period and therefore the initial rapid rate of infusion is not carried out. The patient is allowed to be ambulatory, moving from bed to chair as far as the tubing will permit. A number of patients being prepared for operation have received 3000 or 4000 cc. daily for ten days or more.

When sufficient calories cannot be given by mouth, caloric nutrition can be maintained or supplemented in this manner.

COMMENTS AND CONCLUSIONS

Preliminary studies suggest that complete caloric and essentially complete nutritional requirements can be provided parenterally by the use of glucose, amino acids, alcohol and vitamins.

With this therapeutic armamentarium, it is unnecessary for the sick individual to suffer any degree of lost nutrition. A nutritional loss may be almost as debilitating as the disease itself.

In a series of more than 300 hundred operations, we have completely eliminated any period of starvation with the parenteral use of glucose, amino acids and alcohol, and in so doing, these patients have not experienced the lethargic, exhausted, ambitionless feeling so commonly observed previously for two to four weeks after an operation. The convalescent recovery at home has been materially decreased. Early ambulation has been accomplished much more easily.

The poor surgical risk patient, incident to nutritional loss, has been transformed to a good surgical risk by this method of alimentation. This has been done as both a supplemental feeding, or as the sole feeding.

Alcohol can provide calories, the energy from which can thereby spare the need for using reserve store of glycogen and protein. In like manner, administered glucose and amino acids can be utilized to replenish the depleted stores of these nutritional elements, rather than being expended to supply the immediate energy requirements of the sick individual.

It appears that alcohol has a beneficial effect upon the motility of the gastro-intestinal tract and bladder, reducing the incidence of gas pain colic and its associated sequelae, and in like manner, reducing the need for postoperative catheterization and its sequelae.

Our preliminary studies suggest that the optimum nutritional requirement of a patient, suffering from disease or the effects of an operation, are provided when at least 18 per cent of the caloric intake is derived from protein, presuming, of course, that the total caloric intake is adequate. This contention is maintained on the basis that when this percentage of protein was provided with adequate calories, the greatest nitrogen balance and the least nitrogen excretion was observed.

It appears that, though an adequate quantity of nitrogen intake is provided, these nitrogen are not economically utilized unless adequate and readily available calories are provided to protect them. Alcohol seems able to provide these essential calories.

Alcohol can also provide postoperative sedation sufficient to eliminate most of the need for narcotics, the undesirable effects of which are well known.

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NATIONAL STUDY OF CONGENITAL MALFORMATIONS AND MATERNAL INFECTION

In an effort to collect more precise data on the relationships between certain maternal infections and congenital malformations, a nation-wide study is being sponsored by the American Academy of Pediatrics and the National Society for the Prevention of Blindness. Questionnaires are being sent to obstetricians, ophthalmologists and pediatricians, seeking the reporting of cases of German measles in expectant mothers and of children with congenital defects that might be attributed to other infections in the expectant mother, such as measles, chicken pox, mumps and influenza.

Although an association has been established between the occurrence of German measles early in pregnancy and certain congenital defects in the offspring, information is lacking as to the frequency with which this happens and as to the possible influence of other communicable diseases that might have been contracted by the expectant mother.

Data will be studied by the following committee: Herbert C. Miller, M.D., Professor of Pediatrics, University of Kansas Hospitals, Kansas City, Kan.; Stewart Clifford, M.D., and Clement A. Smith, M.D., both of Boston; Josef Warkany, M.D., of Cincinnati; James Wilson, M.D., of Ann Arbor, Mich.; and Herman Yannet, M.D., of Southbury, Conn. Physicians knowing of cases are urged to register them with Dr. Miller, chairman of the committee.

1948 CONFERENCE OF THE NATIONAL SOCIETY FOR THE PREVENTION OF BLINDNESS

The 1948 Conference of the National Society for the Prevention of Blindness will be held April 5-7, at the Radisson Hotel, Minneapolis, Minnesota. Reservations may be made by writing directly to the Radisson Hotel. The preliminary program is as follows:

MONDAY, APRIL 5, 1948:
9:30 A.M. to 12:00 Noon—Registration (no fee)
12:15 P.M.—Luncheon meeting
3:00 to 5:00 P.M.—Public Health Responsibility for Eye Health
8:00 P.M.—Vision in Education

TUESDAY, APRIL 6, 1948:
9:30 A.M. to 12:00 Noon—Organizing the Community for Sight Conservation
2:00 to 4:30 P.M.—Teamwork for Industrial Eye Care (Panel discussion)
7:00 P.M.—Conference Dinner (Dress optional)

WEDNESDAY, APRIL 7, 1948:
9:30 A.M. to 12:00 Noon—Scientific Advances in Prevention of Blindness
12:30 P.M.—Luncheon meeting
4:00 to 5:30 P.M.—Education of the Exceptional Child

Treatment of Syphilis, with Special Reference to Penicillin

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THE treatment of syphilis previous to the introduction of salvarsan was a confused and ununified procedure. When the arsenicals, mercury and, subsequently, bismuth eventually were recognized as the most satisfactory drugs for its treatment, there was a constant effort to develop a system of employing them that offered the highest incidence of cure and the lowest rate of complications. From the time of the single "curative dose" of Ehrlich up to the continuous system of treatment, in which arsphenamine and bismuth are given without rest intervals for a period of eighteen months, many varieties of therapeutic programs were suggested. All of these programs were suggested in an effort to produce a high incidence of cure among patients who had early syphilis.

As the results of these systems are compared, it is apparent that the "cure rates" approximated each other closely, when the number of injections of each drug and the time involved in the giving of the treatment are taken into consideration. Not all of these methods of treatment have been successful because a program that has a failure rate of 40 per cent or more is not looked on with favor. In those systems in which the results were considered satisfactory, the incidence of successful serologic and clinical effects approximated 75 per cent.

The fact that 25 per cent of the patients who had early syphilis failed to derive a "cure" from the same amount of treatment that was received by those who had a successful result suggests that the individual or the organism causing the disease was the basis for the failure. In the laboratory when animals were studied it was suggested that the virulence or strain of the Spirochaeta pallidum might explain the failures; however, in a clinical appraisal the evidence does not support this suggestion. In fact, the evidence is definitely in favor of the inadequacy of the patient's defense mechanism as the more likely explanation of the unsuccessful results. Many patients who have early syphilis have been cured of their disease after two or three injections of arsphenamine, while many others have failed to receive a successful result after several hundred injections of the drug. Between these two groups are many cases in which, after treatment with varying amounts, results of serologic tests of the blood remain positive for the rest of the patient's life although he has no difficulty whatsoever with the disease. These are the cases in which the permanent type of latency develops which remains as a fixed state and if the patient is not overly concerned about the positive results of blood tests he has no inconvenience from the disease after treatment. In approximately 25 per cent of cases late serious complications develop, and such manifestations as cardiovascular, neurologic involvement and, less frequently, visceral syphilis, make up the majority of these sequelae.

It required an experience of twenty years to accumulate information on the inadequacy of arsphenamines and the heavy metals. In fact, the study of the Co-operative Clinic* group demonstrated what treatment did not accomplish rather than what could be anticipated from it, and although the results of this combined study were of negative type, the information acquired stimulated the search for new methods of employing the remedies available.

The suggestion was made by Hyman, Chargin and Leifer[1] that arsphenamine given by the continuous drip method for a period of five days would produce a higher incidence of "cure" in cases of early syphilis than other methods then being used. Although the procedure required a period of hospitalization and the complications from treatment were common, the results as indicated by clinical and serologic arrest of the disease were highly satisfactory, as 85 per cent of the patients had successful results.

This procedure was undergoing trial when Mahoney, Arnold and Harris[2] demonstrated, in June, 1943, that penicillin is of value in the treatment of syphilis. In spite of the fact that penicillin has been subjected to a mass study under the direction of the National Research Council, and that several hundred thousand patients with syphilis have been treated in many clinics during the past three years, the investigations have not as yet revealed the answers to many questions in regard to penicillin therapy. A study of the results of treatment with different doses, of varying time intervals of injections and of the intravenous and intramuscular route of administration is still going on and must continue for at least five years more before the accumulated data assumes authenticity. While this survey continues and efforts are directed toward determining the ideal dose-time relationship, individuals who acquire syphilis must be treated. Some known facts about penicillin and its influence on syphilis have been gathered which permit of planning a program of treatment for patients, albeit that changes will be made as the inadequacy of these systems of treatment becomes known with the passage

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*From the Section on Dermatology and Syphilology, Mayo Clinic.

*Co-operating clinics and directors: The syphilis clinics of the Johns Hopkins University, the Mayo Clinic, the University of Michigan, the University of Pennsylvania, the Western Reserve University; Joseph E. Moore, M.D., Paul A. O'Leary, M.D., Udo J. Wile, M.D., John H. Stokes, M.D., Harold N. Cole, M.D. Representing the United States Public Health Service: Thomas Parran, M.D., R. A. Vonderlehr, M.D., Lida J. Usilton, M.A., and Eleanor Vandoren.

of time and accumulation of experience with a larger group of patients.

It is now known that the earlier treatment with penicillin is started in the course of the syphilis, the better are the results. When treatment is begun during the seronegative chancre phase; that is, before the results of serologic tests have become positive, there is a likelihood of "cure" in 90 per cent of the cases. As the disease develops, and when secondary lesions on the skin and mucous membranes are present, the incidence of successful results decreases to about 70 per cent.

Therefore, effort should be made to start treatment as soon as the diagnosis can be made by darkfield examination of material from the chancre, and if the patient has passed through this phase of the disease, the serologic test of the blood and darkfield examination of material from the secondary lesions should be made before treatment is started. It may seem out of place to make mention of the fact that a patient should not be treated for early syphilis until laboratory confirmation of the diagnosis has been made, but I do it because patients are still encountered who had been treated because it was suspected that they had a chancre. Even though a few days' delay in starting the treatment does slightly lessen the incidence of "cure," it is obligatory that the diagnosis is established by some definite means other than by the clinical impression before treatment is instituted.

Experience has shown that the best results follow use of a dose of approximately 3,500,000 units of penicillin, given intramuscularly at the rate of 50,000 units every three hours. This requires that the patient stay ten days in the hospital, which is at the present time the outstanding objection to this system of treatment. In addition, it has been found advisable to supplement the administration of penicillin with injections of mapharsen and bismuth, which may be given concurrently with the penicillin or before and after it.[3] At the present time at the Mayo Clinic we give an injection of mapharsen of 0.04 gm. on each of four successive days. On the fifth day administration of penicillin is started and when the afore-mentioned schedule is completed, an insoluble bismuth preparation is given at the rate of 1 cc. every five days until twenty injections have been given.

The quantitative titer estimation adds materially in evaluating the result of treatment and is a satisfactory guide in determining the need for repeating the course of treatment described. The titer estimation of the blood reported in terms of units ranging from 3,600 to 0 gives a more graphic picture of the status of the infection than does a report of a strongly positive, positive or weakly positive result of a serologic blood test. In many cases of early syphilis the titer may be reported as 1,280, 640, 320 or 160 units and after treatment it may decrease gradually to 40, 20 or 10. A steady decrease of this type is a favorable indication and frequently by the sixth or eight month after treatment the titer has been reduced to 0 and the results of serologic tests have become negative. In some cases the results of treatment are not so satisfactory in that the titer will be reduced to 10 or thereabouts, remain at that level for a few months and then begin to increase again up to 40, 80 or more. Such an increase is an unfavorable sign because experience shows that an increase in the titer strength usually precedes by several months a clinical relapse. Accordingly, titer estimations should be made at monthly intervals after treatment and when the titer remains stationary at 20 or 40 units for three months or when it shows an increase in strength, a second course of treatment identical to the first one should be given. The results indicate that by following such a procedure and not waiting until a relapse occurs, as indicated by recurrent lesions of the skin and mucous membrane, the effect of the second course of treatment is decidedly more favorable.

The regimentation of the treatment of early syphilis is not advisable. It is not expected that the condition in all cases will react similarly to the same amount of treatment, so that when evidence of failure is apparent or suggested, it is recommended that a second and, occasionally, a third course of treatment with penicillin, mapharsen and bismuth be given.

Mention has been made of the fact that hospitalization and a three hour intramuscular injection schedule are the drawbacks to penicillin therapy. In addition, complications such as urticaria, painful hips after injections and vesicular eruptions of hands and feet are annoying but not serious. The possibility of a Herxheimer reaction, the activation of a syphilitic lesion, should be borne in mind in cases of both early and late syphilis.

In an effort to simplify the procedure of treatment, Romansky and Rittman [4,5] suggested the use of penicillin in beeswax and oil. Although this reduces the number of intramuscular injections to one a day for a period of ten to fourteen days, the results from this type of treatment are somewhat less satisfactory than those noted after the penicillin, mapharsen and bismuth system has been used. Investigations are under way to improve the results of use of the beeswax-oil combination and it may be that such an improvement will be described in the future, but until it is, physicians must bear in mind that the better of the two methods is still the more inconvenient to both physician and patient.

The incidence of positive results of examination of the spinal fluid in cases of early syphilis is lower after penicillin therapy than after any previously described treatment. This indicates that the incidence of clinical neurosyphilis may be reduced materially in a decade or two among patients who have received this type of treatment. Under the arsphenamine-bismuth program in approximately 15 per cent of cases examination of the spinal fluid has given positive results, while after treatment with penicillin evidence of invasion of the central nervous system has been present in between 2 and 5 per cent of cases.

The results of the treatment of syphilis of the central nervous system have been less successful than the treatment of early syphilis. Favorable changes in the spinal fluid have been in my experience the most outstanding effect, while improvement in the clinical manifestations of tabes dorsalis and general paresis has been rather conspicuous by its absence. Results of the cell count are influenced more favorably by penicillin than those of the various other tests of spinal fluid and the colloidal gold curve and the results of estimations of protein content and, last, of the flocculation or complement fixation test are favorably influenced in the order given. The higher the cell count when treatment is started, the more striking has been the decrease, and the few cases in which the spinal fluid returned to normal, in my experience, were those in which a definite meningeal reaction had been noted. It has been necessary to use fever therapy in conjunction with penicillin for treatment of patients who had clinical signs of tabes dorsalis or general paresis and, contrary to the experience of others, I have not seen a remission develop in a case of general paresis after the use of penicillin alone. It has not been demonstrated that large doses of penicillin, for example, 20,000,000 units, have been more successful in the treatment of these clinical types of neurosyphilis. Accordingly, it is still advisable to give the patient who has clinical neurosyphilis the benefit of a course of fever therapy rather than continue to give repeated and protracted courses of penicillin or mapharsen and bismuth.

Experience with penicillin therapy in cases of cardiovascular syphilis does not as yet warrant deductions. It is too early to note whether or not penicillin will reduce the incidence of aortitis or aortic regurgitation and it is likewise too early to know the effect of penicillin on these complications. At least five years of treatment and observation of patients with aortic syphilis must elapse before it will be possible to estimate the results of penicillin therapy.

Probably the outstanding value of penicillin is in its ability to prevent the transmission of syphilis from the pregnant mother to the offspring. The reports have indicated that 95 per cent or more of the mothers [7-9] who have syphilis and receive penicillin during their pregnancy have normal children. This also includes women who have recently-acquired syphilis. Three million units given during the last part of the first trimester is usually enough to prevent transmission of the disease to the child; however, if the mother's syphilis is acute, it is well to repeat a second course of penicillin at the beginning of the third trimester. It is somewhat paradoxical that, although the syphilis is not transmitted to the child, the mother is not always "cured." Also, it is recommended that women who have had syphilis for several years and are in the latent phase of the disease undergo a course of penicillin therapy during each pregnancy.

Unfortunately, the results from the treatment of the syphilitic newborn infant are not so satisfactory; likewise, the influence of penicillin on the retarded manifestations of congenital syphilis, such as interstitial keratitis, is not great enough to warrant its use. In such cases it is still advisable to use mapharsen and bismuth in conjunction with fever therapy. Fever may be induced with typhoid vaccine, malaria or the fever machine.

The influence of penicillin on the less serious complications of acquired syphilis, such as gumma of the skin and osteitis, is very striking. These late lesions of the skin melt out rapidly after a course of 3,000,000 units of penicillin and the lesions of bone do likewise. A striking influence of penicillin is noted in the lesions of bone which, as the result of surgical interference or some other factor, have become secondarily infected. In the past, the use of arsenic and bismuth frequently failed to heal such lesions because of the secondary bacterial infection; however, after the use of penicillin, the results are highly satisfactory because the effect of the antibiotic is twofold, that is, on the Spirochaeta pallidum and on the anaerobic streptococci that are usually present.

The treatment of latent syphilis with penicillin has been discouraging thus far. In cases in which the patient has had syphilis for ten or more years, results of examination of the spinal fluid are completely negative and no evidence of cardiovascular involvement can be recognized, the use of penicillin has been of slight benefit in reversing the positive results of serologic tests. The same may be said in the case of so-called Wassermann fast syphilis in which the important point is to determine why the results of serologic tests remain positive. In certain of these cases the results are positive because the reaction of the spinal fluid is positive or because cardiovascular or some other form of visceral syphilis is present. In these cases treatment should be directed toward the complication but in the individual case in which the syphilis is of twenty or more years' duration and in which none of these complications are present, treatment is usually not necessary. The reason for this statement is that the serious complications of syphilis are recognizable in the great majority of cases by the fifteenth year of the disease, so that if in five years beyond that point serious sequelae have not developed, the probabilities are that they will not be manifested subsequently. The significance of persistently positive results of serologic tests decreases with the duration of the disease in the absence of involvement of viscera or the central nervous system. In fact, serologic negativity will develop in many of these cases when the patient is placed under observation and not treated.

The penicillin therapy of syphilis has been a great advance. However, the method of administration, the time-dose relationship and the number of courses necessary as yet have not been determined definitely. The low complication rate, the high percentage of successful results and the comparatively short time necessary for treatment are definite improvements over results obtained with the older types of chemotherapy. So, until experience with the various treatment systems of employing penicillin are thoroughly evaluated, it seems advisable to continue to use the program that is producing the best results at the moment, but to keep an open attitude so that as the appraisal continues and modifications or amplifications are recommended the system of treatment that you are using may be changed accordingly.

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Book Reviews

Gifford's Textbook of Ophthalmology. By Sanford R. Gifford, M.D., and Francis H. Adler, M.D. 512 pages, 431 illustrations on 310 figures, 29 in colors. Philadelphia: W. B. Saunders Company. Price $6.00. Fourth edition. 1947.

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Dr. Adler, Professor of Ophthalmology at the University of Pennsylvania Medical School, was chosen by the late Dr. Gifford to carry on the writing of this textbook. He has given special attention to changing trends in medical education, and to the elimination of many of the more technical aspects (largely of concern to specialists only) in favor of more comprehensive coverage of the facts of value to the general practitioner.

The new edition has been rewritten with greater emphasis on physiology of the eye, more comprehensive material on the eye in general medical and neurological disorders, and more detailed presentation of medical and other nonoperative treatments.

On the physical side, the book now appears in a larger format, designed for maximum convenience and readability. A good percentage of the figures are new for this edition and the total number of illustrations has been increased to 431.

This handy book is both medical and surgical but the practitioner is apt to value it most for the sure guidance it gives in dealing with those eye disorders (including injuries) that come almost invariably to the family doctor for treatment.

J. N.

Diagnosis and Treatment of Diarrheal Diseases, by W. Z. Fradkin, M.D. New York: Grune & Stratton, Inc., 1947. 254 pp., illustrated.

* * *

Throughout the world diarrheal disorders have always been a great problem for the medical profession. In each country and in sections of countries, the cause of these diseases has varied. After years and years of clinical and laboratory studies, our knowledge concerning the care of diarrheal disturbances is still limited. The war period brought this out very clearly. However, much has been learned recently in the broad field of gastroenterology especially through the extensive research carried out in the armed forces and in civilian life.

In this book the author brings together in a very practical way the various laboratory and clinical aspects, the diagnostic problems and the therapeutic results in the managements of diarrhea. There are chapters on general considerations of the diarrheal problem, specific diarrheal diseases, and diarrheas of infants and children. The monograph is not only of national but of international importance. May it be recommended for all general practitioners as well as specialists everywhere.

A.V.S.

Headache, by Louis G. Moench. The Year Book Publishers, Inc., Chicago, 1947. 207 pages, 58 illustrations, $3.50.

* * *

This small book is an excellent and fairly comprehensive review of the subject of headache. In the first chapter on "the pathologic anatomy and physiology of headache," the author has succeeded in condensing and presenting in a simple understandable method much of the more recent investigations on this subject. The second chapter on "headaches due to intracranial pathology, spinal puncture and ventriculography" is a little weak. It is obviously impossible to cover such an extensive field in but 27 pages. In attempting to do so, the author has omitted a great deal of significant information and has handled this most important material in a very superficial manner. The remainder of the book is well balanced and covers such subjects as the neuralgias, histamine headaches, and migraine.

Because of its simplicity and compactness, this book can well be recommended. It covers a wide range of scattered and complicated literature that would be difficult for the average physician to obtain. It is an excellent review of a subject that should be of interest to everyone practicing medicine. A.B.B.

The Oculorotary Muscles, by Richard G. Scobee, B.A., M.D., Instructor in Ophthalmology, Washington University School of Medicine. 355 pages; 113 illustrations. St. Louis: C. V. Mosby Co., 1947, $8.00.

* * *

Aimed at clarifying a branch of medicine long shrouded in mystery, this book emphasizes the importance of knowledge of the subject of the ophthalmologist and ophthalmic surgeon. The author has succeeded in presenting his material in a relatively simple manner with a logical approach to the diagnosis of dysfunction of the oculorotary muscles. "Oculorotary" has been coined by Dr. Scobee and added to the medical vocabulary herein.

In essence, the book introduces the tools of diagnosis and then leads to a lucid and concise explanation of their use. The material presented combines the opinion of recognized authorities in the field and the original efforts of the author—and all are applied to the modern therapy of "crossed eyes." Angle Kappa is discussed with details for the first time within memory.

The publishers state that the book is the first new one of its kind in ten years. J.N.

Office Immunology. Edited by Marion B. Sulzberger and Rudolf L. Baer. Chicago: The Year Book Publishers, Inc. 420 pages, 1947. $6.50.

* * *

This book is a true manual for the physician in relationship to the immunological procedures in practice. There are chapters on common technics—diagnostic, prophylactic and therapeutic procedures, immunology of infections, immunologic principles of transfusion reactions, respiratory allergies, dermatologic immunology, immunologic management of spider, insect and snake bites, and miscellaneous allergies. Everything is presented in more or less outline form, making it easy to find whatever information one wishes. No sacrifices have been made in this form of presentation. Every procedure and every suggestion as to therapy is presented in a practical way which makes this book one of the most valuable assets of recent years for the busy practitioner and his associates including the office personnel. As a guide, but not a text-book, the publication is highly recommended. A.V.S.

Stumbling Blocks in the Treatment of Fractures

F. E. Clough, M.D.
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SINCE the day of my graduation forty-five years ago, I have been working to a greater or less degree with fractures. Today, just as in the earlier years of my practice, I frequently encounter problems in that field. It is my belief that difficulties with certain sets of conditions are common to all of us. However, before taking up specific problems, there are a few general stumbling blocks to be considered.

When a patient is not satisfied with results obtained following an injury and wishes advice for what appears to be a palpable deformity, the physician's attitude in giving it is all-important. Derogatory remarks should not be made towards the physician who first treated the case nor should dissatisfaction be shown through facial expression. Rather, the history of the accident should be gone into carefully; an inquiry made into the methods used, the complications that arose, the cooperation that the patient or his family did not give; every detail bearing on the case should be discussed; the patient and the X-rays should be examined carefully. If all this is done, the physician is in a position to properly evaluate the case and can take time to explain everything to the patient. He can also prevent the patient from starting a malpractice suit against the physician who first treated him.

There is no field in the practice of medicine where individualism is so prominent as in the handling of fractures. There is no *one* way of doing things. Methods that bring good results in one person's hands are unsatisfactory in others, while the converse is equally true. This means tolerance of great degree.

In regard to the healing of a broken bone, if we take time to explain to the patient the limitations of function that may ensue, hard feelings may be eliminated.

Nonunions are often due to continued, meddlesome interference with the fragments. It requires much fortitude to let well enough alone.

Specific problems which concern the various types of fractures will be discussed.

SCAPHOID FRACTURES

In civil life, as well as in the late war, the most commonly overlooked fracture has been one involving the scaphoid bone of the wrist.

The story is always the same. An adult falls on the outstretched hand; no palpable deformity is present such as is produced by a Colles fracture. There is pain in the wrist while quiet, and more so when it is moved. When pressure is applied to the back of the wrist proximal to the base of the thumb—the so-called snuff box—marked tenderness is encountered. As the wrist is flexed to either the radial or ulnar side and one of the first three fingers is crowded against the corresponding carpal bone, the distress will be more pronounced. An X-ray of the wrist shows no fracture.

This is in all probability a fractured scaphoid. The patient should not be advised to continue working and to use hot applications when at home. Invariably he will wind up with a long drawnout arthritis. On the other hand, if a short plaster cast is applied to immobilize the wrist and thumb, with abduction of the thumb, he will be much more comfortable and may be able to continue at work. Two weeks later, with the cast temporarily removed, another set of X-rays can be taken and a fracture line will now show across the middle of the scaphoid.

Immobilization must continue a minimum of eight weeks, often for twelve, and not unusually for eight months. Most scaphoids get their blood supply from one or the other fragment only and union is very slow. Repeated heavy short casts will permit a man to labor during this extended treatment. Once in a while the one or the other fragment will not remain alive and an aseptic necrosis will take place which produces much distress. It may be necessary to take out one of the fragments or to put in a bone peg to reunite them.

An X-ray diagnosis of "bipartite" scaphoid is given because this bone occasionally develops from two centers. This cannot be a correct diagnosis if there is local tenderness. Not so long ago, I saw a case in which both scaphoids had been injured and the X-ray diagnosis was bipartite. Clinically, the man had fractures. In the course of a long drawn-out treatment, the fragments on one side united perfectly—a condition that would not have occurred in a bipartite case—while one fragment in the opposite wrist developed an aseptic necrosis and was removed, with good function restored.

COLLES FRACTURES

We are accustomed to diagnose this fracture at a glance by the characteristic deformity; however, it may appear in a straight wrist. If there is local pain when the lower end of the radius is squeezed, the chances are good for an impacted fracture.

In the proper reduction of a Colles there are two stumbling blocks: (1) The crescent-shaped lower articulating end of the radius always tilts toward the palm of the hand. If replacement in that direction is not complete, the patient will forever have limited wrist flexion toward the palm; this also gives a remaining deformity. (2) If the lower fragment, as viewed from an antero-posterior plane, cannot be forced back into its proper position on the end of the upper fragment but projects over the radial border of the radius, it makes a radial deviation of the wrist. This throws all of the flexor muscles of the hand and fingers into an awkard position and reduces the strength of those muscles to

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such an extent as to seriously handicap the working ability of a man.

How can this complete reduction be secured? The time-honored method is to overextend the wrist and then flex it to the maximum. For some time I have been "whip-cracking" the lower fragment into position. This is done by grasping the forearm just below the elbow and quickly snapping the free hand forward and not allowing it to rebound out of position. In a large percentage of cases, complete reduction can be attained by this method. Of course, many fractures cannot be completely and accurately reduced and one is compelled to accept partial reduction.

I usually splint the wrist in a neutral position but often use the old-fashioned pistol grip. In many cases, due to the obliquity of the fracture line, the only way the fragments can be held in position is in marked palmar flexion.

Splints. Personally, I prefer plaster flat splints of about six or seven thicknesses on the front and back of the forearm. There is no need of padding and better holding of the fragments occurs without it.

What are the stumbling blocks in splints?

1. It does no good to make these splints immobilize the fingers and it is very harmful to prohibit finger motion. Tendons in the hand will freeze quickly. One must insist on full finger and thumb motion from the very moment of injury, even if painful. I tell every patient these joints must be moved 732 times each day.

2. Swelling usually takes place in the first twenty-four hours. Advise the patient to return the next day. If the fingers are swollen, the thin gauze bandage holding the two plaster splints in place can be quickly cut, relieving all tension.

3. If a circular plaster cast is put on at the start, even if it is cut when applied, there is liable to be swelling which will not go down because of the tightness. To use a cast as a final dressing is perfectly all right. Only recently I saw a heavy plaster circular cast that had been cut, but swelling continued due to one tiny strand not having been divided.

4. A plaster dressing heavy enough to support an elephant's leg is not necessary.

Finally, telling the patient the arm will be as good as new is not true. Such a result occurs only once in a blue moon and this will not be the time. In securing finger motion I have used two pieces of physiotherapy apparati; one, a rubber ball to be carried in the pocket and constantly squeezed; the other an electric light socket with a thumb screw on it, to be used in every possible position.

Supracondylar Fractures

If a child is running and falls on an outstretched hand, the chances are he will receive a supracondylar fracture, just as an adult receives a Colles or a scaphoid fracture. The diagnosis is usually easy because the forearm and short humerus fragment are usually dislocated backwards. (Soon after Sir Robert Jones brought out the acute angle method of reduction of this fracture, I presented a paper covering the same point before this society.)

If one examines a side view of the humerus, it is noticed that the lower articular end is not in direct line with the axis of the bone but protruded forward at an angle of 130 degrees. The bone is built in this manner to permit complete flexion of the elbow joint. Therefore one must not be satisfied with reduction until this position is again attained. There is another anatomical fact to be utilized here. The tendon of the triceps muscle runs over the back of the elbow joint in such a manner as to act as a bowstring when the elbow is flexed. This prevents slipping of the lower fragment.

Instead of a heavy plaster cast or a metal splint, a piece of adhesive plaster 2 inches wide, made to encircle the arm and forearm at the level of the wrist, will prevent straightening of the elbow and that is all that is necessary. This type of dressing allows free motion of the shoulder and makes it much easier for the patient.

In this fracture swelling occurs quickly, within a few hours, and one must be on guard against Volkmann's ischemic paralysis. Should the patient begin to complain of tingling in the fingers or swelling of the hand, loosen the dressings at once, and even then it may be too late. Bandaging is not always the cause of this condition; blood from the injury may gravitate beneath the deep fascia and cause sufficient pressure to cut off circulation. Fibrosis of the muscles quickly develops. I have been unfortunate enough to have had two cases develop in my own service.

When an accident involving a joint fracture has occurred some time before the case is observed, there is marked swelling of all of the structures around the injury. Should one resort to means to combat the swelling, or should the fracture be reduced at once? In my opinion, much of the swelling is due to pressure from misplaced fragments on blood and lymphatic supplies and I have adhered to the policy of immediate reduction, and have then tried to combat the swelling. It seemed that the swelling went down much more rapidly under this procedure than when a later alignment of the fragments was attempted. I think this is especially applicable to injuries around the ankle. Again it is necessary to state there is no *one* way of doing anything.

In handling fractures where motion in the joint is limited soon after the injury, I believe much damage is done by administering an anesthetic and forcibly "pump-handling" these joints to break up adhesions. Every time this is done there is further insult to the joint. Rather, one should be more gentle and work at these joints slowly and use various elastic type apparati to solve the problem. In other words, one big doctor can do much harm to one small child by too much forcible manipulation. Games whose object is joint motion should be tried.

Surgical Neck Fractures

For forty-five years I have stumbled regularly on this type of fracture. I have plated them; driven a long nail down through the head into the medullary cavity of the shaft; lost one nail that migrated too far down, necessitating further surgery for its removal; fastened the humerus against the chest wall; encountered all kinds of difficulties trying to keep a bandage in place on a large woman with too much tissue that could not be compressed, and in general, have had more headaches with this fracture than with any other type. It has been a fracture principle to endeavor to line up the long fragment in the direction taken by the shorter one. Taking advantage of that idea, many years ago someone conceived the airplane splint. If there was ever devised an impractical, uncomfortable, unsatisfactory, unwieldy piece of apparatus, this is it. No matter how carefully put on, it always slipped down and did not hold the fragments. It has been another principle to set an extremity with muscles balanced, but this held the deltoid permanently contracted while in place. This cantilever bridge, however, proved to be very awkward for the patient.

If the fragments can be approximated, they can often be brought alongside the chest wall through the tight action of the long head of the biceps which extends from the upper margin of the glenoid to the upper arm and acts as does the triceps tendon. For a long time we put a pin through the lower end of the humerus, kept the patient in bed several weeks with a weight to draw out the muscles and thus approximate the fragments.

Now to accomplish the same purpose we have swung to the other end of the pendulum and are using the "hanging cast." This opposes all the principles of fracture treatment in that it neither reduces the fragments nor immobilizes them. A heavy cast is applied to the entire upper extremity extending from the upper humerus to the wrist, with the elbow at a comfortable angle. A collar and cuff sling is applied, never a triangle bandage. This heavy cast tires out the muscle and ultimately aligns the fragments just as a pin traction does. This method permits ambulation from the start. Even though this is unscientific, it works and that is, after all, the criterion of the method. As soon as the fragments are in apposition, the heavy cast can be replaced by a lighter one.

Recently we had a problem trying to hold the fragments of a shaft of the humerus fracture which was complicated by a forearm and olecranon fracture. No conventional method would work. A Roger Anderson apparatus was applied to the humerus and satisfactory alignment secured. Imagine how we had stumbled when further X-rays showed a subcoracoid dislocation of the head of the same humerus. With this apparatus, it was finally possible to reduce this most difficult case. I wonder how we might have done it by any other closed method.

No man can have excellent results in one hundred consecutive bad fractures, so it is necessary to be fair in evaluating methods. What ever works best in the hands of the man who handles the case is the method of choice, even though it does not conform to your ideas.

Neck of Femur Fractures

With an average increase of fourteen years in the span of life in this country, many more people are reaching the hazardous period between sixty and eighty when fractures of the neck of the femur most frequently occur.

We stumble greatly by telling the family of the patient nothing can be done for such an injury. Only in the debilitated with a short hold on life remaining should one adopt a "let alone" policy. I have nailed two hips in paralytics who could barely walk before the accident and who were able to get around as well afterwards.

If there is one injury in which standardization has taken place it is in treating fractures of the neck of the femur by some method of internal fixation. We think few patients are too old or feeble to use this method. There is little shock to the patient which is more than offset by the later comfort and ease in handling. Patients with nailed hips can immediately sit up in bed and be turned from side to side to prevent hypostatic pneumonia. By teaching them immediate contraction of the quadriceps muscles and insisting on some bending of the various joints, their muscles remain in active condition, instead of becoming bound down.

There are a few stumbling blocks in using any of the various types of apparati.

1. Incomplete reduction. Unless the fragments are accurately replaced, no type of internal fixation will be of value. We make use of the Ledbetter technic for reducing this fracture, performed as follows: With the patient on a table and the operator standing on a box, the knee and hip are flexed to right angles. With the operator's hands beneath the knee, heavy traction is applied in a direction toward the ceiling; the foot is then inverted and the leg straightened. If reduction is complete, the toes will point toward the ceiling and remain in that position. If they fall to the side, reduction is incomplete and the maneuver must be repeated until the toes remain pointing toward the ceiling.

2. Starting the pin too far down on the shaft, making the approach to the head at an acute angle.

I like to start the pin about an inch below the bulge of the great trochanter. The angle at which to drive it is carefully measured on X-ray films before starting. If the patient is lying flat on the table with the toes pointing straight up, the nail can be driven horizontally in the same plane as the table top. Some men prefer to have the toes inverted and then drive the nail slightly downward. This is a matter of individual preference. With added experience one can usually tell whether the pin is traveling correctly. We stumble in not driving the pin deep into the head to give a firmer hold. At this point two-way X-rays are always made to check the location. To reset the pin at this time is no disgrace, but it is one to leave the pin in an improper relation. Again the type of internal fixation used is a matter of individual preference. We have used the Smith-Peterson, Neufelt, Blount blade plate, Moores pins, Roger Anderson pins and bars.

3. Letting the patients up too soon. With the present fad of getting all operative patients up in a day or two following surgery—a replica of the plan of thirty-

five years ago—one is almost counted a heretic to advise rest in bed. I can see little reason for immediate ambulation in these elderly patients, who are never too sure on their feet. This is more evident in the so-called "shearing type" fracture, where the fragments are so liable to slip.

4. If it is not wise to do some type of internal fixation, should we do nothing? Certainly not. One can always put on some type of "well leg" traction without any shock and thus improve the comfort of the patient.

5. Promising too much. Even with all these new methods, not more than 70 per cent will have a satisfactory result and be able to get around without crutches or the use of a wheel-chair.

The large double spica cast, as advocated by Whitman and used for so many years, does not interest me. True, it does occasionally give bony union, but the trials and tribulations of the old person wearing one of them is too great.

It is far simpler to do some type of operation and more securely fix the fragments. One can never be sure that the fragments will not slip inside a cast, no matter how carefully perpared. This fact is even more apparent in fractures of the shaft of the femur.

. . . MEET OUR CONTRIBUTORS . . .

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The Diagnosis and Treatment of Acute Vascular Occlusions in the Extremities

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ACUTE vascular occlusions in the extremities are medical emergencies which demand early and accurate diagnosis and prompt treatment. The occlusion may occur in either an artery or a vein. The clinical manifestations of occlusions in these two locations are different and the treatment is different.

ACUTE ARTERIAL OCCLUSION

Acute arterial occlusion may be caused by arterial embolism or acute arterial thrombosis *in situ*. Arterial embolism usually results from detachment of a portion of an intracardiac thrombus which has developed in a fibrillating left auricle or on the surface of a recent myocardial infarct. The embolus may be a portion of a vegetation from a heart valve affected by endocarditis. Rarely it is a part of a thrombus which has developed on the wall of the aorta or an artery more proximal than the one occluded. Acute arterial thrombosis occurs most commonly in arteriosclerosis obliterans, less commonly in thrombo-angiitis obliterans and rarely as a simple thrombosis complicating surgical operations, polycythemia, severe infectious diseases or advanced malignant lesions or resulting from idiopathic thrombophilia. From the standpoint of survival of the limb the prognosis is somewhat better in arterial embolism than in acute arterial thrombosis, since a smaller part of the artery is occluded. From the standpoint of ultimate survival of the patient the prognosis is somewhat worse in arterial embolism than in acute arterial thrombosis since the former condition usually indicates serious heart disease and the possibility of embolism in vital organs. The clinical manifestations of acute arterial occlusion in the extremities are essentially the same whether the occlusion is due to embolism or to thrombosis.

The clinical manifestations of acute arterial occlusion of the brachial or femoral arteries are usually severe and dramatic. They are less severe when one of the secondary arteries, such as the radial, ulnar, anterior or posterior tibial arteries, is affected and in such instances only slight ischemia of the limb may develop. The diagnosis is based on the clinical manifestations.

Sudden occlusion of the brachial or femoral artery usually produces severe diffuse pain in the extremity distal to the point of occlusion and the onset of the pain is usually sudden. The affected extremity is pale, cold, has a shrunken appearance and collapsed superficial veins. Arterial pulsations are absent distal to the point of the occlusion. Hypesthesia or even anesthesia with a glove or stocking distribution is common and there may be partial or complete loss of motor function of the distal portion of the extremity. In severe cases, particularly if the condition is untreated or poorly treated, after twelve to twenty-four hours the extremity may take on a mottled cyanotic appearance and gangrene may develop gradually.

The treatment of sudden arterial occlusion is based on the following considerations: 1. The ischemia of the limb is produced in part by the organic arterial occlusion and in part by severe secondary arterial spasm below the point of occlusion. The spasm may endure for twelve to twenty-four hours. Persistence of the spasm may be the factor which converts relatively mild ischemia to severe ischemia which permanently damages the tissues. 2. When spasm relaxes, extensive secondary thrombosis may occur in the arterial tree below the point of occlusion because of ischemic damage to the arterial endothelium. 3. An original thrombus may slowly extend proximally and produce more and more ischemia, or an original embolism may be the forerunner of other embolisms from more thrombosis at the original source of the embolus. 4. The skin and tissues of an extremity which has suddenly become ischemic are easily injured by heat, cold, chafing or other minor trauma of the skin. The four cardinal principles of treatment are to produce relaxation of arterial spasm, mechanically increase blood flow, prevent further thrombosis and protect the extremity from thermal or mechanical injury. An early diagnosis and the rapid institution of treatment are exceedingly important. The effectiveness of treatment will be inversely proportional to the duration of time from the onset of the occlusion until the time that treatment is begun.

Specifically the following plan of treatment is recommended: 1. Do not elevate the extremity. 2. Do not use hot-water bottles, hot packs, heat cradles, diathermy, ice packs, refrigeration or massage on the extremity. 3. Place the patient in a warm room (temperature 80° to 85° F.). 4. If a Sanders oscillating bed is available, put the patient on the bed set for the maximal low-foot, minimal low-head position. If such a bed is not available, place the patient in a low Fowler's position. 5. Wrap the extremity loosely in cotton batting and keep the bed clothes off it with a cradle. 6. Give papaverine hydrochloride ½ grain (0.032 gm.) intravenously and repeat the dose in two hours if necessary. 7. Give 2 ounces (60 cc.) of whisky every four hours for the first two or three days. 8. Give 50 mg. of heparin intravenously every four hours (except in cases of vegetative endocarditis). 9. Give 300 mg. of dicumarol the first day, 200 mg. the second day and every day thereafter that the concentration of prothrombin is more than 20 per cent of normal (except in cases of vegetative endocarditis). Discontinue doses of heparin when the value

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Read at the meeting of the North Dakota State Medical Association, Fargo, North Dakota, May 27, 1947.

*Division of Medicine, Mayo Clinic.

for prothrombin drops to less than 30 per cent of normal. 10. If relaxation of arterial spasm is not indicated by definite lessening of the manifestations of ischemia in six hours, block the regional sympathetic ganglion with procaine hydrochloride. 11. If this procedure does not improve the circulation in three hours and the occlusion is due to embolism, do an embolectomy. (Thrombectomy for arterial thrombosis *in situ* is almost never successful.)

In my experience this program of treatment, when instituted early, has been successful in the prevention of gangrene in almost all cases of arterial embolism and in about 75 per cent of cases of acute arterial thrombosis. Embolectomy has rarely been necessary. Anticoagulant therapy with dicumarol should be continued for at least three weeks. If facilities for determining the prothrombin time are not available, heparin can be given continuously intravenously in dilute solution (200 mg. per liter) instead of dicumarol. If this is done, the coagulation time of the blood should be maintained between fifteen and twenty-five minutes.

The patient may be allowed up within one to two weeks if the color of the limb is good, if pain has disappeared, if sensation and motor power are normal and if his cardiac status does not require longer rest in bed. Subsequent treatment is the same as that for chronic occlusive arterial disease. If the arterial occlusion was due to an embolus from a fibrillating auricle, use of quinidine in an attempt to stop fibrillation should be seriously considered after anticoagulant therapy has been maintained for two weeks. The risk of further arterial embolism when normal rhythm is established by quinidine in such cases is very small and probably much less than the risk of further embolism from the fibrillating heart after anticoagulant therapy is discontinued.

If gangrene does develop, amputation of the extremity will be necessary. It may be delayed for one or two weeks. Anticoagulant therapy should be discontinued before amputation and resumed within twenty-four hours after amputation.

Acute Occlusion of Veins

Acute occlusion of the veins of the extremities almost always is caused by thrombosis. The diagnosis of thrombosis of small superficial veins, of the long and short saphenous veins and of varices is easily made since the thrombosed tender veins frequently can be seen and always can be palpated as firm tender cords. In this presentation I wish to confine my remarks concerning acute occlusion of the veins to two conditions, acute thrombophlebitis of the deep veins of the calf and the popliteal veins and acute thrombophlebitis of the iliofemoral veins. In almost all cases these vascular lesions start as thromboses. Slight to moderate phlebitis develops as a reaction to the thrombus within a few hours in all cases if the thrombus remains in the vein. It is rarely possible to make a clinical diagnosis of venous thrombosis before the phlebitis has developed. For practical purposes the attempt to distinguish between so-called phlebothrombosis and thrombophlebitis has led to general confusion since there is no agreement concerning the basis for the distinction. From the standpoint of pathogenesis, venous thrombosis, thrombophlebitis and pulmonary embolism are all stages or phases of the same disease and for practical purposes it is less confusing to call the disease thrombophlebitis when it is recognized clinically in the extremity. At this point it should be mentioned that a thrombus in a vein, if it is going to become detached and form an embolus, does so soon after it has formed or not at all and usually this occurs before it has produced clinical symptoms. This is why most pulmonary embolisms occur before venous thrombosis can be recognized clinically. However, after symptoms have developed the thrombosis may extend or a new thrombus may develop in another vein and detach to form an embolism. If such new thrombi can be prevented embolism can be prevented.

Thrombophlebitis, affecting the deep veins of the calf or the popliteal or the iliofemoral vein, usually occurs as a complication of a surgical operation, the puerperium, severe injury, acute infectious disease, heart disease, blood dyscrasia or carcinoma. In the first four of these conditions the period during which the complication may occur is limited. Acute thrombophlebitis does not produce severe symptoms and the acute manifestations almost always subside within three weeks. The important reasons for early diagnosis of thrombophlebitis are first that it marks the patient as having a tendency to more venous thrombosis and therefore pulmonary embolism and, second, that good treatment during the acute stage may reduce the tendency to subsequent development of disabling chronic venous insufficiency of the limb.

The diagnosis of acute thrombophlebitis of the deep veins of the calf is not always easy. The outstanding clinical manifestations are pain and tenderness in the calf muscles. Slight elevation of temperature and increase of pulse rate may occur. Slight prominence of the superficial veins of the leg and slight enlargement of the leg below the knee may or may not be noted. The temperature of the skin is usually not changed and arterial pulsations are not affected. Homan's sign, pain in the calf on forcible dorsiflexion of the foot, is present in some but not all cases. If pain and tenderness develop in one calf with slight elevation of temperature during the second week after an operation or obstetric delivery, the diagnosis of thrombophlebitis of the veins of the calf can be made with a high degree of certainty.

If the thrombophlebitis extends into the popliteal vein, tenderness of the popliteal vein, slight enlargement of the leg and slight prominence of the superficial veins usually are present. Venography has been used in the diagnosis of acute thrombophlebitis of the veins of the calf and the popliteal veins. The best appraisal of this procedure at present is that it is technically difficult and liable to misinterpretation or error in about one third of the cases. In the hands of one who has had much experience with it, it may be of some value.

Acute iliofemoral thrombophlebitis is characterized by a triad of signs: acute enlargement of the leg and thigh, prominence of superficial veins, with or without slight cyanosis of the skin, and tenderness in Scarpa's triangle. The body temperature may be elevated but rarely is higher than 102° F. Chills almost never occur. Slight to moderate pain usually is present in the calf and thigh, particularly along the femoral vessels. The temperature of the skin of the extremity affected is usually slightly higher than that of the companion extremity. In a few cases of acute iliofemoral thrombophlebitis there may be arterial spasm at the onset. In these cases the extremity is cold, arterial pulsations may be absent for a few hours, pain may be severe and acute arterial occlusion may be suspected. The distinguishing points are the tenderness in Scarpa's triangle and the enlargement and appearance of congestion of the leg and thigh, manifestations which do not occur in acute arterial occlusion. Acute diffuse lymphangitis of the leg should be distinguished from acute iliofemoral thrombophlebitis. In the former there are usually chills, high fever, much malaise, diffuse redness of the skin and no prominent superficial veins.

The treatment of acute thrombophlebitis is a subject of controversy at the present time. At the Mayo Clinic we keep the patient in bed with the leg elevated to an angle of 30 degrees until pain and tenderness are gone, until temperature has been normal for three days and until all swelling has disappeared below the knee. This means usually for one to three weeks after the onset. We do not believe that earlier ambulation is practical or wise and we are of the opinion that longer rest in bed is liable to produce osteoporosis, atrophy of the muscles and postphlebitic neurosis, particularly if the seriousness of the condition is overemphasized to the patient. While the patient is in bed, we keep continuous hot wet packs on the affected leg from foot to groin in cases of iliofemoral involvement. When the patient first gets up, the leg is equipped with a supportive elastic bandage of light weight if the veins of the calf only were affected and a heavy solid rubber bandage if the iliofemoral vein was affected. The leg is bandaged from toes to knee and the patient wears the bandage while he is ambulatory for six to twelve weeks or longer if edema develops when he goes without it. Bandaging during this period is one of the best safeguards against the development of chronic venous insufficiency.

At the clinic we feel that anticoagulants should be given to almost all patients who have acute thrombophlebitis as soon as the diagnosis is made. The purpose is to prevent extension of thrombosis or its development in other veins and, therefore, to prevent pulmonary embolism. No fatal embolisms and only a few small pulmonary infarcts have been encountered in more than 400 cases of thrombophlebitis so treated. Dicumarol with preliminary heparinization is probably the best and safest program of anticoagulant therapy. In a few cases anticoagulants should not be used. Hepatic and renal insufficiency are contraindications to use of dicumarol but not of heparin. Purpuric states, blood dyscrasias with bleeding tendencies, subacute bacterial endocarditis and recent operation on brain or spinal cord contraindicate use of both anticoagulants.

Ligation of veins in cases of acute thrombophlebitis has been recommended by several surgeons. The purpose is to trap the thrombus and thus prevent pulmonary embolism. The femoral vein may be opened, a thrombus removed and the vein ligated with little if any subsequent embarrassment of the venous circulation of the limb. Ligations of the external iliac vein and of the inferior vena cava have been done. In general the record of venous ligation is not as good as the record of anticoagulants in the prevention of pulmonary embolism. This is because a subsequent embolus may develop from a thrombus which has arisen somewhere proximal to the ligation or in the other extremity. Theoretically the only type of ligation which will certainly be effective in the prevention of pulmonary embolism is ligation of the vena cava. This procedure is a major operation, is not without risk, and almost certainly will increase the tendency to chronic venous insufficiency of the affected limb to some degree. Ligation of veins is the second best method of prevention of pulmonary embolism in cases of acute thrombophlebitis. It may be advisable in cases in which use of anticoagulants is contraindicated, facilities for their use are not available or thrombo-embolic episodes recur over a long period of time.

Blocking of the lumbar sympathetic ganglia with a local anesthetic agent has been advocated for treatment of acute iliofemoral thrombophlebitis. We do not use it at the Mayo Clinic. It has been said that it relaxes arteriolar spasm and venous spasm, relieves pain and prevents subsequent edema. In our experience it has no effect on edema and is rarely if ever necessary for arterial spasm. The presence of venous spasm has not been demonstrated and there are simpler ways to relieve pain which is rarely severe anyway. The procedure is not simple and often its use is a painful ordeal for the patient.

SUMMARY

Acute arterial occlusion of an extremity is a medical emergency and frequently indicates serious underlying cardiac or vascular disease. Early diagnosis and early institution of appropriate treatment are important if circulation is to be re-established and gangrene prevented. Acute thrombophlebitis may indicate a predisposition to further venous thrombosis and pulmonary embolism. Appropriate treatment will prevent such an embolism and minimize the development of chronic venous insufficiency of the limb.

The JOURNAL LANCET

Official Journal of the

American Student Health Association
Great Northern Railway Surgeons' Association
Minneapolis Academy of Medicine
North Dakota State Medical Association
Northwestern Pediatric Society
Sioux Valley Medical Association
South Dakota Public Health Association
South Dakota State Medical Association
North Dakota Society of Obstetrics and Gynecology

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Editorial

A PREVENTIVE APPROACH TO THE PSYCHIATRIC PROBLEM

It can be safely estimated that approximately one-half of all patients consulting physicians are either psychoneurotic with no evidence of physical disease or their physical complaints are exaggerated out of proportion to their true significance. This, plus the fact that approximately one-half of all the hospital beds in our nation are occupied by psychiatric patients, attests to the magnitude of the emotional and psychological problems encountered in medical practice.

Intensive studies of the disturbed adult have revealed the relative importance of the early life experiences and the reactions to them in the genesis of many psychiatric disorders. Studies on children who present problems in adjustment have further emphasized the importance of the early years when basic patterns of the personality are in the process of formation.

From these studies on children several pertinent findings can be stated with confidence. (1) A larger number of children have severe emotional problems than is generally appreciated. (2) Severe emotional problems in children can and do express themselves not only in "behavior problems," so-called, but also in typical psychiatric illnesses such as conversion hysteria or the anxiety states. Physical complaints not substantiated by careful physical and neurological studies frequently are simply manifestations of emotional problems. (3) Definition of emotional tensions and institution of proper methods of management can help a significant number of these children and their parents. (4) Disturbed children, overlooked and untreated, constitute the reservoir from which many adults with long-sustained psychiatric conditions emerge.

Today, more than at any previous time in medical practice, the physician is giving increasing attention to an understanding of the pressing problem of mental health and its solution. Many authorities consider it the most important medical problem facing our nation.

While programs are being developed for the training of specialists in the field of mental health and additional treatment centers are being organized to serve communities, the need far outstrips the supply of trained personnel. The problem of mental health will be nearer its solution when every physician, regardless of his interest, is cognizant of the importance of emotional tension in every patient he sees. The next step is development of skills in helping the patient and his family resolve the tension. This is a preventive approach, particularly productive in dealing with children.

With but few exceptions, the physician continues to be the first one consulted when "anything goes wrong." His is a unique opportunity and a challenging responsibility.

REYNOLD A. JENSEN, M.D.,
Department of Pediatrics,
University of Minnesota

AMERICAN STUDENT HEALTH ASSOCIATION

The annual meeting of the American Student Health Association is to be held in Detroit, Michigan, on May 7th and 8th. The Association this year is the guest of Wayne University. An excellent program is being arranged.

On the afternoon of May 6th, there will be a conducted tour of Greenfield Village. Dr. Forsythe of the University of Michigan is inviting the members of the Association to visit the Health Service of the University of Michigan.

Johns Hopkins University, Baltimore, Maryland, has applied for membership in the American Student Health Association. Frank R. Smith, Jr., M.D., is Director of Personnel Health Clinic."

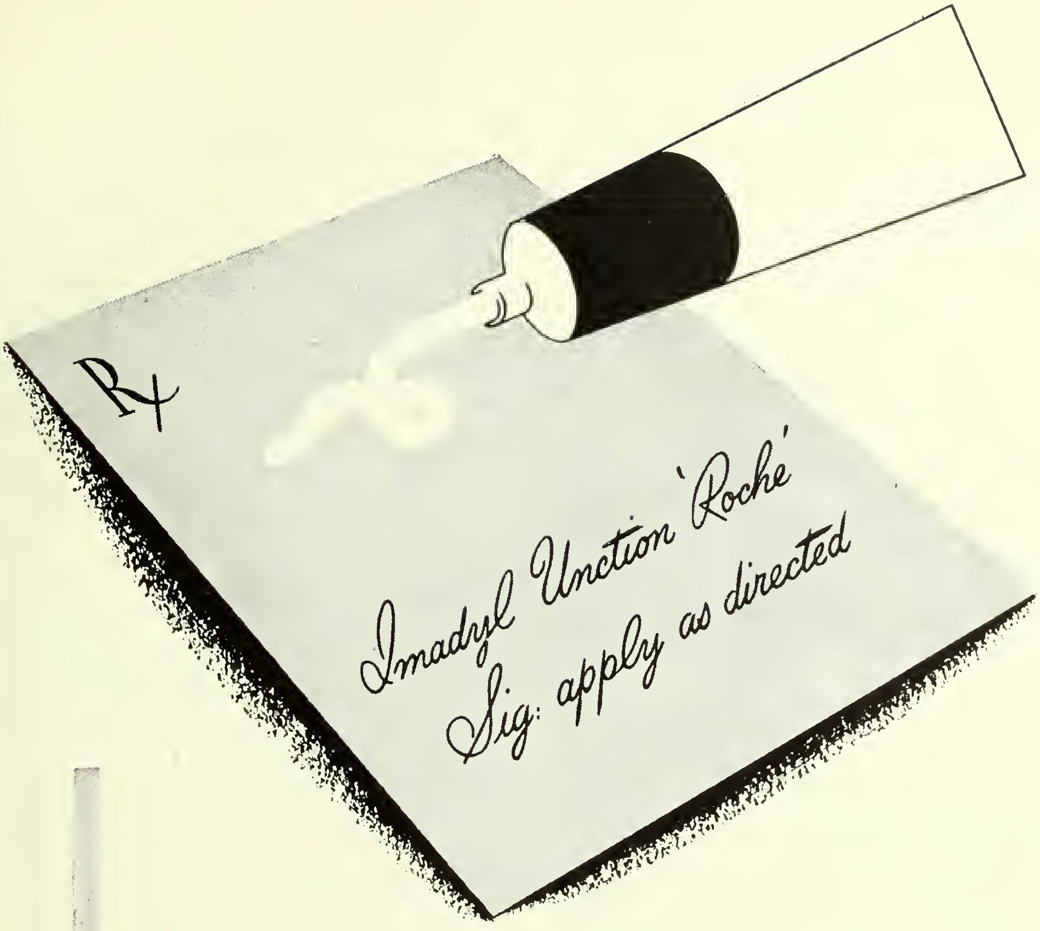
The Student Health Service of McGill University, Montreal, which has been administered by the Department of Physical Education, has been transferred to the Department of Health and Social Medicine of which Dr. R. P. Vivian is Chairman, and Dr. C. W. MacMillan is Director of Student Health Service.

Dr. Anna M. Gove, who was eighty years of age, died on January 28, 1948. She was a pioneer in student health work, having come to the Woman's College of the University of North Carolina, Greensboro, North Carolina, in 1893 as college physician, the second year the college was established. In the more than fifty years that she was connected with the college, because she continued in a part time capacity even after her retirement as head of the department, a number of years ago, she made a unique place for herself in the hearts of thousands of students and alumnae all over this state. She was very progressive in her ideas of student health work, and in coopertaion with the late Dr. Paul R. McCain, Superintendent of the North Carolina State Tuberculosis Sanatoria, established one of the first college tuberculosis case-finding clinics in the country. She also took a great interest in the American Student Health Association, was Vice-President and served on the Council in 1934.

Dr. Charles E. Lyght, Director of Health Education for the National Tuberculosis Association for the past five years, resigned December 1, 1947, to join the staff of the Medical Division of Merck and Company, Inc., of Rahway, New Jersey.

Elizabeth Main, M.D., has been appointed to replace Miriam Bell, M.D., as Director of Student Health at Woman's Medical College of Philadelphia.

Bruce Roxby, M.D., has replaced Mr. Frederick Prosch, now deceased, as college physician at Temple University.



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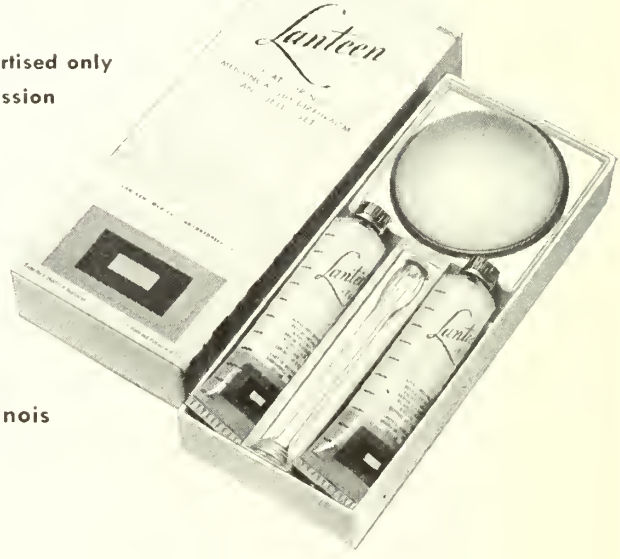

. . . NEWS ITEMS . . .

NORTH DAKOTA

North Dakota is off to a good start in solving one of its big problems—lack of hospital beds in rural areas.

Since June, the state department of health has reviewed plans for new hospitals involving 300 to 325 beds, to cost about $2,225,000.

Officials estimate the state needs between 600 and 700 more hospital beds, despite the fact it now has about 5 beds per 1,000 population, which is above the national average.

However, these beds are not spread out enough throughout the state, according to one view.

Most of the smaller communities now planning hospitals hope to get some of the $308,000 federal money allotted to North Dakota for this fiscal year.

Dr. John A. Sandmeyer, specialist in urology, has joined the staff of the Grand Forks clinic, it was announced February 8.

Dr. Sandmeyer comes from Great Falls, Montana, where he had been a member of the staff of the Great Falls clinic.

Dr. Robert L. Goulding of Cleveland, Ohio, is now associated with Dr. Charles Vogl in medical practice in Bowman.

Dr. Malcolm A. McCannel was elected president of the Northwest District Medical society at the annual meeting held in January. He succeeds Dr. F. R. Erenfeld, who served during the past year.

Dr. M. W. Garrison was renamed vice president. Dr. Henry Kermott was chosen secretary and Dr. A. R. Sorenson, delegate to the meeting of the state medical association. The holdover delegate is Dr. D. J. Halliday of Kenmare.

A talk on psychosomatic medicine was given by Dr. Gordon Kamman, associate professor at the college of medicine, University of Minnesota.

Dr. B. R. Kinkade of Minneapolis joined Northwest clinic, Minot, staff March 1.

Dr. O. P. Johann of Milwaukee is now associated with Dr. C. J. Glaspel in practice of medicine in Grafton.

The board of Rolette county commissioners has appointed Dr. B. J. Hughes of Rolla as the new county health officer.

He succeeds Dr. H. E. Neve of Rolette who had asked to be relieved of the office. Dr. Neve is coroner of the county.

Another Rolla physician, Dr. S. C. McCrae, was appointed to replace Dr. Hughes on the insanity board.

(Continued on page 112)

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ACCEPTED COUNCIL ON PHARMACY AND CHEMISTRY AMERICAN MEDICAL ASSOCIATION

A native of Bottineau, Dr. Roy K. Quamme, has been named chief medical officer of Fargo Veterans hospital, succeeding Dr. H. C. Manaugh, who has been transferred to Fort Howard, Maryland. Dr. Quamme, who assumed his duties in January, comes from Fort Snelling, Minneapolis.

Dr. Melvin E. Beltz is now associated with Dr. E. Wasemiller in the practice of medicine in Wahpeton.

Dr. W. W. Murrey presided at the meeting of the Advisory Council of the North Dakota State Medical Center, instead of Dr. W. W. Morse, as was reported in the February issue of JOURNAL-LANCET.

The annual meeting of the Kotana District Medical society was held in Williston January 27. Dr. I. S. AbPlanalp was elected president; Dr. Allan Johnson, vice president; Dr. A. G. Skjelset of Watford City, secretary-treasurer; Dr. J. D. Craven, delegate to the state medical association meeting, and Dr. Allan Johnson, alderman.

SOUTH DAKOTA

A resolution opposing the federal control or subsidy of nursing education and favoring continuance of the present system of nursing training schools was approved by the Aberdeen District Medical society at its regular meeting in Aberdeen in January.

A second resolution approved by the groups asks that all 4-H club members in Brown county be given physical examinations by their family physician as a part of the clubs' health program.

New officers elected for 1948 were: Dr. J. Bloomendaal, Ipswich, president; Dr. W. D. Farrell, Aberdeen, vice president; Dr. J. C. Rodine, Aberdeen, secretary; Drs. Paul McCarthy and Carson Murdy, both of Aberdeen, delegates; Drs. Paul Bunker and Granville Steele, both of Aberdeen, alternates; Dr. Paul Scallon, Redfield, and Drs. Paul Bunker and J. E. Bruner, Aberdeen, board of censors; and Dr. J. D. Alway, Aberdeen, councillor.

New members elected to the society were Drs. M. E. Nugent and C. L. Vogele, Aberdeen, and Dr. J. F. Malloy, Faulkton.

Dr. Albert M. Harris, 35, of Sioux Falls, succumbed in a hospital here to the disease he had spent his life attempting to fight.

Dr. Harris announced through the South Dakota Journal of Medicine and Pharmacy the new test which possibly may lead to finding the cause and cure of cancer. At the time of the announcement Harris was suffering from a malignant brain tumor. He had been ill of the fast acting cancer since the first of the year, according to his friend and former teacher, Dr. J. P. Tollman.

(Continued on page 114)

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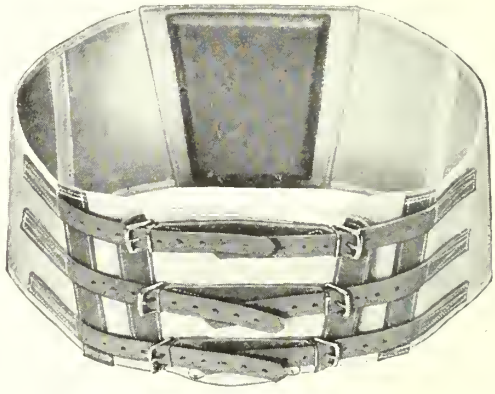

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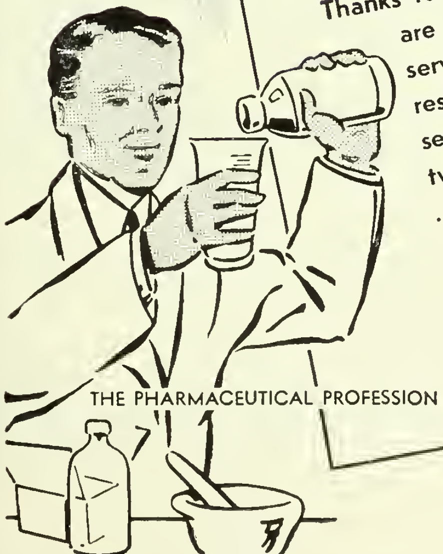

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1. Kasper, J. A. and Jeffrey, I. A.: A Simplified Benedict Test for Glycosuria, Amer. J. Clin. Pathology, *11*:117-21 (Nov.) 1944

2. Haid, W. H.: The Use of Screening Tests in the Clinical Laboratory, J. Amer. Med. Tech., *8*:606-14 (Sept.) 1947.

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Dr. Harris based his test on the previously-known fact that enzyme Hyaluronidase, an organic material, always is present in cancerous tissue.

Opening of a new physiotherapy and hydrotherapy department in the Huron Clinic, with Miss Helen Buchanan in charge, was announced by Dr. J. C. Shirley.

Dr. Rubert S. Anderson, formerly assistant professor of physiology at the University of Maryland medical school, has been appointed professor of physiology at the University of South Dakota Medical school, Dean Donald Slaughter has announced.

Dr. W. H. Holloran, Jackson, Minnesota, was elected president of the Sioux Valley Medical association as the organization concluded its three-day 52nd annual meeting at the Martin hotel on January 29.

Dr. Halloran succeeds E. J. H. Kerr, Akron, Iowa. Dr. Walter Benthack, Wahne, Nebraska, was re-elected vice president, and Dr. Anton Hyden, Sioux Falls, treasurer. Dr. Martin Blackstone, Sioux City, was named to succeed Dr. R. H. McBride, also of Sioux City, as secretary.

Sioux Falls was selected as the association's 1949 convention site. The invitation to hold the meeting in Sioux Falls was extended by Dr. N. J. Nessa, Sioux Falls, who represented the Seventh District Medical Society of South Dakota.

MINNESOTA

Dr. Fred W. Wittich, Minneapolis, has been notified by the state department that he has been awarded a diploma for allergy lectures delivered at the Instituto Brasileiro de Historia in Rio de Janeiro, Brazil, in December 1946.

Dr. Henry Michelson of Minneapolis has been invited to be the guest of honor of the California State Medical Society at their annual meeting in San Francisco in April. He will discuss cutaneous cancer before the general assembly and the Lupus Erythematosus problem before the Dermatological section. Dr. Michelson has also been invited to give the postgraduate lectures in Dermatology at the University of British Columbia in Vancouver in June.

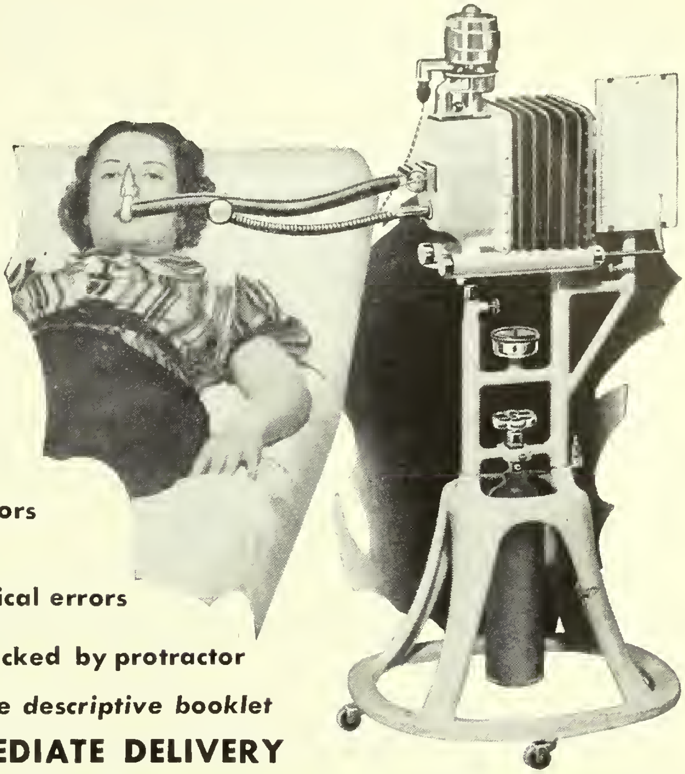
Dr. Reuben Erickson was named chief of staff in staff officer elections at Swedish hospital, in February. Dr. Lawrence Carlson was named vice chairman. Committee heads are Drs. Robert Quello, M. L. Fredlund, Hamlin Mattson, J. S. Milton, Horace Scott and H. T. Gustason.

Dr. Wallace I. Nelson has been elected chief of staff of Eitel hospital, succeeding Dr. Frank Hirschfield. Dr. Alfred T. Baker was elected assistant chief of staff and Dr. Melvin B. Sinykin secretary-treasurer.

Dr. Frank B. Mach was elected Chief of Staff at St. Mary's Hospital succeeding Dr. James E. O'Donnell. Lawrence J. Happe was re-elected Secretary-Treasurer.

Dr. Myron O. Henry was inducted as president of the American Academy of Orthopedic Surgeons, holding its annual meeting in Chicago in January.

(Continued on page 116)



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Dr. Henry is a staff member at Northwestern hospital, Minneapolis, and a clinical assistant professor of surgery at University of Minnesota.

Dr. Harold S. Diehl, dean of the medical sciences, University of Minnesota, was presented a $75,000 check at the annual dinner meeting of the Minnesota division of the American Cancer Society in January.

This money is the second installment given by the society to finance a cancer research center which is to occupy two floors in the proposed Mayo Foundation.

Dr. Diehl announced that a new cancer detection center, for which the society has granted $15,000, would be open on an experimental basis within the next few weeks with Dr. David State, assistant professor of surgery, serving as acting director.

The center which has the approval of the state medical association, is financed jointly by the cancer society, the United States Public Health service and the malignant disease research fund and the University.

In approving the project, the council of the Minnesota Medical association requested that a limitation of five years be placed on the work; at the end of this time the existing program would be reviewed and plans perfected for the future.

A mental hygiene unit which state officials said will clear the way for the first thorough mental health program on a statewide basis has been established in the Minnesota department of health.

Dr. Viktor O. Wilson, chief of the health department's section of special services, will be acting supervisor until a physician "who has suitable training and experience for the position" is found.

Deaths

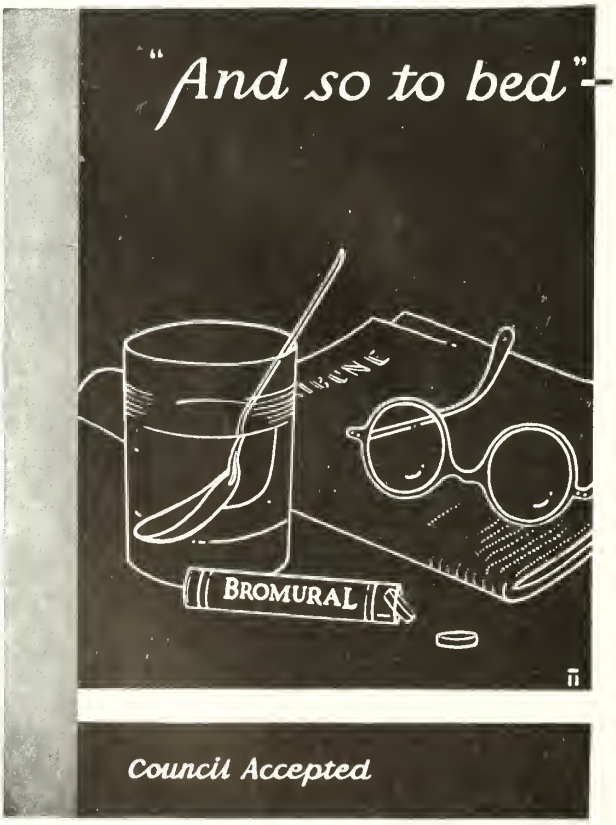
Dr. Sverre Oftedal, 64, who practiced in Fargo, North Dakota, from 1914 to 1936, died in January at Glendale, California.

Dr. Andrew Carr, 93, of Minot, North Dakota, who began his medical practice in Dakota's territorial days, and whose name was linked for many years with medical, educational and civic life in Minot, died January 22 at his home. Dr. Carr, a past president of the North Dakota State Medical association, was one of the founders of the Northwest clinic.

Dr. Charles P. Aling, 69, of Minneapolis, died January 16. He served for more than 40 years on the staff of St. Barnabas hospital.

Dr. W. J. Dailey, formerly of Blooming Prairie, Minnesota, passed away at his home in Oakland, California, on January 9. He was 64 years of age. Dr. Dailey practiced medicine in Blooming Prairie for over 12 years.

Dr. Darry Oeting, 61 years old, prominent St. Paul physician, died in February. He was a charter member of Central Society of Clinical Research, past president of the Minnesota Society of Internal Medicine and of the Ramsey County Medical society, and assistant professor of clinical medicine at the University of Minnesota.



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PREPARATION OF MANUSCRIPTS

JOURNAL-LANCET extends an invitation to the profession for articles with the understanding that they are original contributions not previously published.

Manuscripts are to be typed on one side of the paper with double spacing. Illustrations must be in the form of glossy prints or drawings in black ink. Please do not attach legends to the pictures. A reasonable number (two or three) illustrations are published free of cost; special arrangements must be made for excess or highly finished illustrations or tables.

Bibliographic references should be at the end of the manuscript and not in footnotes. Each reference should include the following information in the order indicated: Name of author with initials; title of article; name of periodical; volume, page and year. Reprints are prepared on order.

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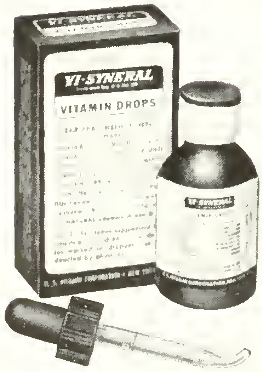

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3. Science: 106:40, 1947.
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Vol. LXVIII, No. 4
New Series

Foreword

THIRTY-SIX YEARS OF ASSOCIATION AND FRIENDSHIP

On January 1, 1912, the *Northwestern Lancet* appeared under its new name, JOURNAL-LANCET. Simultaneously with the legal change of name and to some degree motivating it, the publication became the official journal of the North Dakota State Medical Association. The current special North Dakota issue is in celebration of thirty-six continuous years of association and friendship between the North Dakota State Medical Association and the publishers and editorial board of the JOURNAL-LANCET.

Throughout those years a great many important changes have occurred. Several secretaries, presidents and other officials of the North Dakota State Medical Association have participated in the maintenance and improvement of their journal. The membership at large has contributed immeasurably in various capacities to its pages. Year by year and decade by decade, physicians have taken up the work where others left off so that progress has been continuous. Indeed, there are now few physicians in North Dakota who were in practice thirty-six years ago, but their vision, ideals and all that make for health, lonegvity and the good of the state in every respect are being carried on admirably by those who have continued and those who more recently entered the profession.

Throughout this period of more than a third of a century our editorial staff has also undergone several changees through death and retirement. The present board members are not forgetful that they are building on the firm foundation constructed by those who worked before them. Therefore, we both owe much to our heritage and must see to it that the very best in medicine is perpetuated and new developments are encouraged and promoted.

This April number, a credit to the state membership and to the board of editors and publishers, affords an overall picture of the progress of medicine in North Dakota, from its first days to the present. We take this opportunity to record our admiration and thanks to the pioneers of the profession and to the current corps of medical writers in the state who, by sending papers, news, ideas and pictures, continue the record which has given the seventy-eight-year-old JOURNAL-LANCET its many years of service.

It is our policy to keep the readers abreast of the times by reporting new methods and procedures as soon as possible after they are well established, by providing space so its readers can express their views, publish their original observations and studies, and report progress which they have made. It is our desire to continue the close association and friendship that has existed so long with the North Dakota State Medical Association.

J. A. MYERS, M.D.,
Chairman, Board of Editors

Surgical Sterilization in Women

A Ten Year Study

Charles B. Darner, M.D.*
Fargo, North Dakota

This study was prompted by the request that one of the writers serve as an expert witness in a complaint of malpractice against a reputable surgeon. This surgeon had done a postcesarean section tubal ligation and the patient subsequently became pregnant. It was brought out in the trial that the doctor is not necessarily a guarantor of the operative result. An allowance is made for failure if reasonable diligence is exercised and if there is no evidence of negligence. The doctor won his case. However, we were impressed with the importance of reassessing our indications, of keeping careful records and of explaining to the patient that the operation is not always successful.

In reviewing the articles on surgical sterilization in the female, both postpartum and at other times, we noted that no technic is without failure. Even supravaginal hysterectomy has been followed by pregnancy. A few instances of this occurrence are in the literature.

During the authors' first years in private practice, a number of different technics were used in an effort to decide upon the most satisfactory method in our hands. The Madlener method was used quite extensively. When we encountered four instances of failure, we decided to try to discover the reasons for these failures. The tubes on two of these four patients were removed in subsequent operations and studied. Silk had been used as the suture material. It had cut through the tube in each instance and formed an anastomosis. The tube had reestablished its patency. Further study convinced us that non-absorbable suture material gave so little tissue reaction that it was unsuited for this type of work. The Pomeroy modification was then investigated and it was concluded that resection of a small loop of tube using absorbable suture for the ligation would be just about as simple and more effective. The use of absorbable suture is followed by retraction of the cut ends of the tube into the broad ligament. Thus the purpose of the difficult and more time-consuming methods is accomplished. Since changing to the Pomeroy method of tubal sterilization and using plain catgut suture material, we have had no failure in 141 consecutive cases.

History

The literature on this subject contains numerous varieties of technics. Nurnberger made an exhaustive study in 1917 of sterilization operations and subsequent failures. He concluded that the major cause of failures was the fact that the sutures were either insufficiently secured or tied too snugly. The Madlener technic was described in 1919 and has perhaps been the most popular because of its simplicity. Irving described a new method of insuring sterility following cesarean section in 1924. The critical studies of Rubovits and Kovak, Muller, Lull, Dippel, Von Graff, Lazard, and Fox are familiar to all who are interested in this subject.

According to Von Graff, female fertility has an amazing persistence. We may occasionally see it destroyed by apparently insignificant infection. On the other hand, we see it surmounting heavy odds. Conception has taken place after removal of both tubes as in cases reported by Lasch, Burkard, Zangemeister, and once following subtotal hysterectomy as in a case reported by Liepman. McMilland and Dunn report an even more remarkable incident in which two pregnancies occurred in the same patient three years after supravaginal hysterectomy with excision of all of one Fallopian tube and ovary and most of the other tube, leaving only one ovary and about 1½ inches of the corresponding Fallopian tube.

Religion

Fox found that of 645 patients sterilized at Boston Lying-In Hospital 388, or 60.2 per cent, were Roman Catholic; 178, or 27.6 per cent, were Protestant; 68, or 10.5 per cent, were Jewish; and 11, or 1.7 per cent, were Greek Orthodox Catholic. Lull states that in his study 106 were Protestant, 53 Catholic, 7 Jewish, 1 Quaker, 1 Greek Orthodox and 55 undetermined. Our own studies reveal 121 to be Protestant, 62 Catholic, 1 Jewish, and the balance of 54 undetermined.

Postpartum Tubal Sterilization

Whitacre writes that postpartum tubal sterilization is simple, safe and relatively bloodless. He states that many individuals are unable to use contraception satisfactorily. Some methods are not reliable. He has seen many patients in whom sterilization was advisable for the patients' health. These patients were told to return early in the postpartum periods for operation but few returned unless they were pregnant again. The operation for sterilization is considerably more extensive after involution is complete.

A good share of the cases in this study comprise postpartum tubal ligations. Our conclusions concerning these operations will be discussed later in the paper.

Medicolegal Aspects of Tubal Sterilization

There are several factors to be considered when dealing with these cases. It goes without saying that both the husband and the wife should have a complete understanding of the implications of the operation. One should have signed permission of both parties.

One should certainly be able to defend his indication. This would presuppose that tubal ligation is not done for non-medical indication. The mere fact that a family is hard up is not sufficient reason to warrant sterilization in spite of the fact that it frequently seems desirable

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Presented at a meeting of the Stutsman County Medical Society, February 24, 1948, Jamestown, North Dakota.

*From the Fargo Clinic and St. Luke's Hospital, Fargo.

from a socio-economic standpoint. Woodward writes that consent may be invalid because (1) it undertakes to authorize an unlawful act or an act contrary to public policy, or (2) because it comes from a person who has no lawful right to give consent, or (3) because it was obtained by misrepresentation or fraud. He further states that operations for sexual sterilization, when such sterilization is not necessary for the prevention or cure of disease or antisocial tendencies, are generally regarded as contrary to public policy. However desirable it may be to limit the offspring of certain families, the limitation of the natural increase of the normal population is generally regarded as contrary to national interest.

One may say in passing that in interpreting medical indications, the courts are usually generous.

INDICATIONS

There is not much controversy about the necessity of sterilization when the problem is one of relieving suffering individuals or prolonging their lives or when, in our opinion, a continuation of pregnancies would be harmful. Common indications given by writers on this subject are cesarean section, toxemia of pregnancy, cardiac disease, nephritic disease, difficult labors, varicose veins, thrombophlebitis, previous pelvic operations, tuberculosis, diabetes, psychiatric indications, eugenic reasons, hypertension, carcinoma, and excessive multiparity.

We shall list our indications in tables under "Discussion". If one plots a curve based on the incidence of complications as related to parity, it is shown that there is a sharp elevation in the curve after four children. Hence we hold that multiparity of four or more constitutes ample medical indication.

TECHNIC OF STERILIZATION

We follow the Pomeroy technic and quote Lull's description of it as follows: "The procedure consists simply in picking up the middle portion of each Fallopian tube, ligating it with an absorbable suture and then resecting the loop. The importance of using an absorbable suture cannot be stressed too much, because when one uses silk ligature the chances of fistula formation are unquestionably increased. Practically no bleeding occurs, although when doing this by the vaginal route, some tearing may occur and give rise to moderate hemorrhage. The cut ends of the tube are drawn apart and the plastic exudate of the perineum becomes organized in such a manner that it does not seem possible for a fistula to occur. Both ends of the tube shrink up to very narrow strands."

In the absence of pathology in the ovaries, tubes or uterus, removal of these structures should not be done, particularly before the woman reaches the age of forty. The procedure of choice must be on the tube. Furthermore, the tube must not be removed since blood supply to the remaining ovaries is seriously compromised and there is a considerable likelihood of cystic disease of the ovary and the attending symptoms of menorrhagia if the tube is removed.

For a number of years we made small transverse incisions a few inches below the umbilicus when doing postpartum tubal ligations. This was in line with our belief that transverse incisions are the most physiologic and that incisions made along the lines of skin cleavage leave smaller scars. Since an incision of only 3 cm. is needed, there is very little stretching of the scar and we have recently been doing midline incisions. When ligating the tubes, we use No. 2 plain catgut in preference to chromic, because it gives more tissue reaction.

A report by Carrington and Bullitt in 1943, "Pregnancy after Tubal Sterilization," states in conclusion, "A dry technique, silk, cotton or fine linen should be used on the tubes, broad and round ligaments. The moist technique of catgut with serum reaction about it over the time required for its absorption delays scar tissue healing and gives epithelium of the tube a better chance over a longer period of time to form a canal." We do not feel that this is logical reasoning. Furthermore, it is certainly not borne out by our experience nor by the experiences of others who have written on this subject. The "dry technic" has many advantages but its use in tubal sterilization is not one of them.

DISCUSSION

Our study covers 238 patients cared for over a ten year period—1936-1946. Thirty-five of these cases were sterilized incident to pelvic surgery. (This does not include hysterectomy or other operations which would make pregnancy impossible.) One hundred ninety had postpartum tubal sterilizations and 13 had therapeutic abortions and tubal sterilizations.

Indications were as follows:

Multiparity	119	Toxemia of unspecified type	5
Pelvic surgery (without removal of uterus, tubes or ovaries	35	Tuberculosis	3
Postcesarean section	17	Diabetes	2
Psychiatric indications	15	Otosclerosis	2
Hypertension	14	Rh sensitization	2
Cardiac indications	12	Hyperthyroidism	1
Chronic nephritis	7	Chronic arthritis	1
		Skull injury	1
Nephrectomy	1		
Anemia	1		

There were thirteen therapeutic abortions followed by tubal sterilization. Indications for the therapeutic abortions were as follows:

Hypertension	4	Cardiac decompensation	1
Chronic nephritis	3	Manic-depressive psychosis	1
Tuberculosis	3	Severe epilepsy	1

Of the postpartum tubal ligations, 190 in all, 139 were done on the day of delivery, 43 on the first postpartum day, 5 on the second postpartum day, 2 on the fourth and one on the seventh postpartum day. There was no mortality. Twenty of the 238 patients ran a morbid course according to the A.C.S. standards. Of these, seven were not postpartum. There was one case of ileus in a postcesarean tubal ligation. It was relieved by use of the Miller-Abbott tube. The day of operation did not seem to affect morbidity in this series. It is felt, nevertheless, that the operation should be done as soon as possible after delivery. The importance of operation before the postpartum uterus contains organisms has been stressed by Whitacre. When we use caudal anesthesia, we do the postpartum tubal ligation under the same anesthesia immediately after delivery. Some cases were done under local, using ½ per cent procaine. The majority were done under sodium pentothal anesthesia.

The postpartum operation has not affected the length of time patients spend in the hospital, the average time of discharge being the sixth or seventh day. Our definition of multiparity as an indication for tubal sterilization has meant four or more children. The average multiparity was 5.6. Many of the patients had more than one indication. Only one indication was listed for statistical purposes. Our failures occurred in cases where we used the Madlener technic with nonabsorbable suture material. Two of the cases re-operated showed re-establishment of the tubal canal.

CONCLUSIONS

1. The Pomeroy type of tubal sterilization operation using absorbable catgut yields the most satisfactory results in our hands.

2. Four instances of failure occurred in the Madlener type of operation using silk as suture material.

3. The last 141 consecutive cases of sterilization in which we used the Pomeroy technic have shown no instance of failure.

4. Tubal sterilization should not be done for nonmedical indication.

5. Records should be kept in such a way that one would be able to defend the indications and records in court should this be necessary.

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TENTATIVE SCIENTIFIC PROGRAM
of the 61st Annual Session of the
North Dakota State Medical Association,
Jamestown, North Dakota,
May, 1948

Mayor Olson, Jamestown—Welcoming address.

Dr. Erling Hanson, University of Minnesota—(to be announced).

Dr. John Caffey, New York—Congenital Obstructive Lesions of the Alimentary Tract. Tuberculosis in Children.

Dr. Allen Barnes—The Use of Female Sex Hormones in Clinical Practice.

Dr. P. K. Arzt, St. Paul—Psychosomatic Medicine in General Practice.

Dr. L. G. Pray, Fargo—Pediatrics. Meningitis in Infancy and Childhood.

Dr. Arthur Abt—Diagnosis and Pitfalls in Diagnosis of Polio.

Dr. Mavis P. Kelsey, Mayo Clinic—(to be announced).

Dr. K. Alvin Merendino, University of Minnesota, Department of Surgery—(to be announced).

Dr. P. G. Arzt, President, Jamestown — Presidential Address.

Dr. W. A. Liebeler, Grand Forks, the incoming president.

Dr. M. Dockerty, Mayo Clinic—Solid Ovarian Tumors.

Drs. C. H. Peters and L. W. Larson, Bismarck—Bone Marrow Aspirations.

* * *

Luncheon meetings will be held by the following societies: Obstetricians and Gynecologists; Ophthalmology and Otolaryngology; and Radiological.

The North Dakota Association of Public Health will hold its annual meeting in conjunction with the three-day program.

The Scientific Program will be held on May 24 and 25. The House of Delegates will meet on Sunday, May 23.

A social function will be held on Monday evening.

Recent Therapy in the Treatment of Acne

Ernest Grinnell, M.D.*
Grand Forks, North Dakota

Acne vulgaris is no doubt the most common dermatological problem occurring in the family doctor's practice. Accordingly a study of the general management of a group of cases in which some of the recently developed therapeutic measures have been utilized seems timely and worthwhile.

The treatment of acne can be successful only when it is approached with patience and thoughtfulness. The physician should be cognizant of the fact that proper therapy is embraced by three fields:

1. Psychologic management,
2. General constitutional therapy,
3. Local therapy.

PSYCHOLOGIC MANAGEMENT

Acne is a serious and disfiguring disease and should never be treated lightly by the family doctor. The patient, usually at an age lacking in patience and understanding, is highly emotional. Acutely conscious of his disease, he magnifies the disfiguring aspects of it tenfold, withdraws into a tight shell excluding his former companions and often even the members of his own family. Left to himself, discouraged and disheartened without the help of his physician who, he feels, has brushed him off, he becomes morose and irritable. Some of these patients suffer severe psychic trauma from which they never completely recover.

The first step essential to the successful management of the case is to secure the full confidence of the patient. This can be done only as it is in other fields of medicine—through an attitude of sympathetic understanding and a display of professional skill. Then, and only then, can the patient be expected to report with regularity to his doctor and carry on through the tedious months of treatment when progress is often dishearteningly slow.

On the occasion of the first visit, a few minutes earn profitable dividends if spent going over the etiological aspects of the disease. The patient is better able to treat his acne if he understands it thoroughly. He should be told frankly that the disease is difficult to handle and responds slowly to treatment. However, he must be assured that barring entirely unexpected difficulties, he can be cured. Usually it is safe to set a reasonable time for cure. As a rule, with careful attention to details it will not be too much to expect cure in four months. This may seem like eternity to young patients, but at least it gives them hope and a stubborn determination to see the treatment through to a successful termination.

GENERAL CONSTITUTIONAL MANAGEMENT

A careful scrutiny of the patient's physical condition is necessary. Abnormal weight should be corrected; anemia and diseases of tonsils and sinuses treated; bowel, dietary and sleeping habits corrected; endocrine imbalances adjusted, and vitamin deficiencies carefully investigated. It should be thoroughly impressed upon the patient that the rapidity of cure depends in a large measure upon his strict adherence to a careful and well regulated way of living.

Patients are notoriously forgetful. This is especially true of the adolescent. Therefore a set of typewritten or mimeographed instructions is helpful. There are few instances in the field of medicine where this pays better or bigger dividends than in the treatment of acne.

A printed sheet of the following diet and instructions is given to the patient at his first visit to the clinic.

GENERAL INSTRUCTIONS AND DIET

1. Your diet should consist of vegetables, fruits, milk, eggs in moderation, and meats (only once a day unless engaged in active physical exercise).
2. Drink 6 to 8 large glasses of water daily.
3. Keep bowels regular.
4. Get plenty of fresh air, exercise and sunshine.
5. Care of the skin: Do not use strong or medicated soaps. Avoid the use of extremely hot or cold water. Wash the face and hands in lukewarm water several times daily, using a mild castile soap. Do not squeeze pimples and blackheads!

Omit from Diets: Pastries, pies, cakes, ice cream, soda fountain drinks, cream in any form, jams, jellies, fried foods, gravies, alcoholic drinks, iodized salt, peanut butter, nuts, chocolate and cocoa.

Limit: Sugar, fats, meats, potatoes, bread, rice, noodles, macaroni, spaghetti, cheese.

DIET SUGGESTIONS

Cereals: Cereals, hot or cold, may be eaten with milk (not cream) and a limited amount of sugar daily.

Eggs: Poached, soft-boiled, scrambled or omelet. Not more than once a day.

Soups: All soups or broths. Avoid overseasoning.

Meats: All meats but pork or veal. Meats may be boiled, broiled or stewed, but *not fried*.

Fish: Only fresh water fish. Fish may be baked, boiled or broiled, but *not fried*.

Vegetables: All vegetables, fresh or canned, cooked or raw.

Bread: Whole wheat and graham bread, preferably toasted, hard rolls, corn and bran muffins.

Desserts: Fruits only, preferably stewed.

Beverages: Tea, coffee (without cream), milk, buttermilk.

SPECIAL INSTRUCTIONS

Skin. If your skin is excessively oily, wash the face at least four times a day. Do not use rough wash cloths or complexion brushes. Massage the skin with the fingertips, pressing the oil out of the pores. Rinse with clean warm water and dry with a soft towel. Do not use cosmetics, especially creams.

Scalp. If you are instructed to do so, shampoo the scalp at least once a week. A good tar soap or tincture of green soap should be used. The scalp should be thoroughly lathered, massaged and then rinsed with fresh water at least twice. The scalp medication should be applied by parting the hair every inch or so, dropping in the lotion and then massaging it in with a soft tooth brush.

LOCAL THERAPY

A significant contribution to local therapy was made recently by MacKee, et al., of Columbia University.

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*From the Grand Forks Clinic, Grand Forks, North Dakota.

They reported the use of intraderm sulfur [1] and intraderm tyrothricin [2] for the treatment of acne and pyodermas.

The promising results announced in the original reports of MacKee and his co-workers prompted a trial of the intraderm solutions [3] in our clinic as the basic local therapy for treatment of acne.

A group of 75 unselected cases was treated. It was not expected that all patients would respond favorably to the treatment with intraderm solutions. Nevertheless, the results have been so gratifying as compared to results with methods formerly employed that there appears to be little occasion for change unless an even more efficacious topical remedy is introduced.

Treatment was intensive in the cases most likely to respond to local application. These included acne punctata, pustulosa and indurata. Deeply seated indurated types of acne and acne conglobata were started on routine treatment to clear up superficial lesions and then were given adjuvant treatment which consisted for the greater part of roentgen therapy. In the recalcitrant cases other aids to treatment, such as vaccine therapy, penicillin, heliotherapy, et cetera, were utilized.

The intraderm preparations were started in all cases as a routine measure. If no improvement was noted in three weeks, other methods of treatment were adopted. The common adolescent types (punctata, papulosa, and pustulosa) responded promptly. Ninety per cent showed improvement within three weeks. Cases complicated by deep-seated indurated lesions or pitting and scarring showed variable response; and, as has been indicated, many of these were treated by other means.

The intraderm solutions have a singular advantage over other topical applications in that they are simple to apply and there is a notable absence of messiness. There can be little doubt that these features contribute materially to the success of this method. Patients who usually object to the messiness of other preparations are more cooperative with the intraderm regime.

The method of treatment in the clinic was as follows:

The patient in whom there is no evidence of infection (absence of pustules) is given his set of instructions and admonished to wash his face thoroughly with soap and water at least three times a day. After the evening scrubbing he applies intraderm sulfur starting on alternate nights. The liquid is applied with a cotton applicator or the fingers and is carefully massaged in with a glass cocktail stirrer and allowed to remain on all night. Individuals with sensitive skins occasionally react so actively that it is necessary to restrict the sulfur preparations to very small quantities for the first week or two. Nearly every patient, after becoming accustomed to it, finds it possible and advantageous to use the sulfur every evening. When the tolerance is good and the skin excessively oily, it may even be used twice a day. In the event of a marked reaction, the sulfur should be withheld for a few days and a 10 per cent zinc oxide ointment applied.

Intraderm tyrothricin is added to the regime only when there is secondary infection. This preparation is applied in the same manner as the sulfur and is massaged into the skin one to four times daily, depending upon the severity of the infection. In some cases, best results are obtained by applying intraderm tyrothricin in the form of continuous wet packs. During the period of treatment with the intraderm solutions no other local treatment is used.

Patients who fail to respond to intraderm sulfur and intraderm tyrothricin, frequently improve with the application of hot packs. Burow's and Darier's solution are valuable but cannot compare to Vleminckx's solution [4] for efficacy. There are disadvantages to the use of Vleminckx's solution. Among them are the disagreeable odor, staining of finger nails and tarnishing of silverware. Usually these disagreeable features are accepted cheerfully, however, after the patient has discovered that the treatment is achieving the desired results.

Vleminckx's solution is most efficient applied as hot wet packs in dilutions of 16 cc. of the solution to 500 cc. of water. The packs may be used once or several times daily. An excellent aid to the packs is the application of lotio alba at night. Lotio alba in its usual strength is generally ineffective. Double strength may be utilized at first and increased to triple strength if additional stimulation appears indicated. Some patients object to the powdery residue left on the face after the application of lotio alba. In this event, providing the skin is not excessively oily, a resorcin-sulfur precipitated cream may be employed.

℞ resorcin	.3 — 1.5
ppt. sulfur	.6 — 3.0
unscented vanishing cream	qs 30.0

There are a number of commercial preparations available which may be used to advantage. Among them are Polythionate lotion, Sulfolac and Acnomel.

If the desired chapping effect cannot be obtained, then a stronger lotion may be employed, keeping in mind the fact that acute inflammatory acnes should be treated with caution.

℞ Betanaphtholis		0.12 — 1.3
spiritus vini recti		
zinci sulfatis	—	
zinc sulfocarbolatis	aa	15.0
aquae rosae qs		120.0

Individuals vary considerably in the manner in which they respond. Some react violently to almost any solution which may be applied. Others begin to chap actively only after several weeks. When there is a marked reaction it is wise to discontinue the treatment for a short time and have the patient apply nivea cream or 10 per cent zinc oxide ointment.

Seborrhea of the scalp with or without seborrheic dermatitis frequently precedes the development of acne. Many cases of stubborn acne are complicated by an unrecognized seborrhea of the scalp.

In the clinic, it is a routine practice to examine the scalp carefully. The patient is instructed to wash his face four times a day when seborrhea is present. The scalp should be thoroughly shampooed at least once every five days with tincture of green soap or a tar soap.

An excellent lotion to be massaged into the scalp each evening with fingers or soft tooth brush is as follows:

℞ resorcin	2.4 — 7.5
ppt. sulfur	2.5 — 15.0
Topisol—(optional)	
alcohol) aqua)	aa equal parts qs ad 240.

Topisol [5] may be increased or reduced depending upon the need for oil on the scalp. When the scalp is excessively dry, it may be used undiluted in place of alcohol and water. In the majority of cases, however, this proves to be quite oily and the patient objects to messiness.

Occasionally stubborn seborrhea may require a sal-sulfur cream such as the following:

℞ salicylic acid	.3 — 1.5
ppt. sulfur	.3 — 3.0
unscented vanishing cream	qs 30.0

In cases refractory to other drugs and especially where there is mild secondary infection, the substitution of 1 or 2 per cent cinnabar for salicylic acid may be serviceable.

Ultraviolet radiation is often a valuable aid to other forms of local treatment. In the recalcitrant case, however, roentgen therapy is the treatment par excellence. It should be administered only by a physician thoroughly trained and familiar with the biologic effect of the X-ray. While roentgen therapy is extremely valuable, it has reached a position of undeserved esteem in the minds of the public. There has been a widespread acceptance of the viewpoint that the X-ray is a miraculous cure-all for acne thus obviating the need for messy applications, hot packs and diet. It should be kept in mind that all types of acne do not respond to X-ray; that the patient's age is an important factor in determining whether or not it should be used; and that a concerted effort on the part of patient and physician should first be made to cure the disease by simpler methods.

Vaccine therapy is regarded by most dermatologists as being of questionable benefit. Occasionally, vaccines may be of some value used as an adjuvant to other treatment. The administration of tonics, iron, thyroid, et cetera, should be restricted to the cases in which there are definite indications for their use.

An infrequently mentioned but valuable method for reducing the pitting and scarring of acne is the carbon dioxide (dry ice) slush treatment.[5] This simple procedure offers gratifying help to the unfortunate patient who is left with scars.

The method as employed in the clinic is as follows: A half pound of dry ice is ground finely with mortar and pestle. To this is added an ounce or two of precipitated sulfur. Pure acetone is then added and the mixture stirred slowly until a slush about the constituency of thawing sherbet is obtained. A firm tonsil sponge gripped with a sponge holder is then repeatedly dipped into the solution and applied with moderate pressure and a rolling motion over the entire affected area. At first there is a hissing sound and a temporary blanching effect is noted. This quickly wears off and a superficial desquamation takes place within a day or two.

The interval between treatments varies depending upon the degree of erythema and peeling. Usually, however, the application may be repeated every seven to ten days. Some improvement is usually noted after the first visit. In the majority of cases treatment must be continued over a period of several months.

Similar results, but with a smaller margin of safety in application, may be obtained with the use of a 20 per cent solution of trichloracetic acid after first swabbing the face with 70 per cent alcohol.[6]

SUMMARY

A general study of the treatment of acne vulgaris with special emphasis on the use of intraderm sulfur and intraderm tyrothricin as local application has been presented.

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ANNUAL MEETING OF AMERICAN COLLEGE OF CHEST PHYSICIANS

The Fourteenth Annual Meeting of the American College of Chest Physicians will be held at the Congress Hotel, Chicago, Illinois, June 17-20, 1948. An interesting scientific program has been arranged for this meeting, and speakers from several other countries are scheduled to appear.

The Board of Examiners of the American College of Chest Physicians announces that the next oral and written examinations for Fellowship will be held at Chicago, June 17, 1948. Candidates for Fellowship in the College, who would like to take the examinations, should contact the Executive Secretary, American College of Chest Physicians, 500 North Dearborn Street, Chicago 10, Illinois.

Veterans Medical Care

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TOWARDS the end of the last war it became evident that the Veterans Administration would be completely unable to handle the job of carrying out the program for the veteran as outlined by Congress. General Bradley was brought in to remedy the situation and he induced General Paul R. Hawley, who had shown outstanding ability as director of Medical Services in the ETO, to take over as Chief Medical Director. Dr. Hawley with Dr. Harding and Dr. Magnusson introduced a program of reform which has had far reaching effects. They acted to increase the efficiency of Veterans Hospital by securing better doctors, instituting residencies and cooperating with Medical Schools.

Believing that it would be impossible to provide all medical care in existing or planned Veterans Administration facilities, an auxiliary program for medical care to the veteran in his home community was drawn up. First put into effect in Michigan, a Home Care program is now in effect in 40 states through agreement between the State Medical Societies and the Veterans Administration. It is this home care with which we, as private physicians, are mainly concerned.

Administratively there are two types of arrangement with the V.A. In one, the Michigan plan, an intermediary corporation in Michigan, Michigan Medical Service, acts as agent for the state society. The Kansas plan is administered directly by the Veterans Administration with the advice and cooperation of the state society. Thirteen states use the Michigan plan, eighteen the Kansas.

The Veterans Administration has asked the general medical profession to furnish two types of service: (1) Examination for pension ratings, in which the completed report is presented to a three man board who must decide the degree of disability and award a fair pension from the information furnished by the doctor. Obviously, reports must be complete and accurate. (2) The treatment of service connected disabilities, that is, disease or injury resulting from service or aggravated by service. It is apparent that some government employee will always have to determine whether a given illness is service-connected.

The law provides that a veteran may receive care for a service connected disability from a private physician if such care has been properly authorized. Non service connected disabilities can only be treated at government expense in a veterans hospital and then only if a bed is available and if the veteran will sign a statement that he is financially unable to secure this care elsewhere. The latter provision has become completely meaningless because there is no means test allowed. The availability of beds varies in different parts of the country. We hear that in Salt Lake City 93 per cent of beds are used for non service connected disabilities: *Time* (November 10) stated that nationally 33.2 per cent of beds are used for service connected with 66.8 per cent used for non service connected cases. It is to be remembered that a large percentage of the latter are mental, tuberculosis and other conditions. These patients would not, in any case, be treated in general hospitals and are, in fact, medically indigent because of the nature of their illness. Unfortunately, I do not have available the exact figures, but I believe that over one half, or 30 to 40 per cent of the total beds are being used for mental and chronic cases.

The Veterans Home Care program has been in operation for a sufficient length of time for us to take stock of the situation and we can now make some appraisal of its present success and future prospects. The November 6 conference in Chicago under the auspices of the Council on Medical Service of the American Medical Association gave the various states an opportunity to compare notes and to hear Dr. Hawley. I would like to give you a brief summary of the material presented at this meeting and we may draw a few conclusions from the opinions expressed there:

The Chairman, James R. McVay, pointed out that V.A. spends 7 billion per year, one fifth of the national budget. There are now 18 million veterans. In two years there will be 20 million. Each has three close relatives so in two years there will be 60 million relatives.

MICHIGAN. Mr. John Castellucci, Director Veterans Care program of Michigan, reports the plan operated by Michigan Medical Service, using their fee schedule, functioning smoothly as follows: veteran or doctor applies to V.A. who forwards authority to Michigan Medical Service who sends it to the veteran to take to the doctor of his own choice. The doctor returns report to Michigan Medical Service. They are handling 7,000 to 8,000 cases per month and have 4,500 doctors registered in plan. They report excellent cooperation from V.A.

Michigan originally gave veterans free choice of physician for both rating examination and treatment. Due to inadequate reports and lack of cooperation from many doctors they have eliminated the privilege of free choice of physician for rating examinations. They asked all doctors to register for treatment only or for treatment plus rating examinations. Thereafter, veterans were sent to doctors designated by Michigan Medical Service more or less in rotation for rating examinations. They feel that home care of veterans is workable, good for both veteran and doctor, and will expand in the future.

KANSAS. Mr. Oliver Ebel, Executive Secretary of Kansas Medical Society, stated that Kansas was the second state to inaugurate a plan for home care. There the plan is administered directly by the V.A. under an agreement with the Kansas Medical Society who guarantee availability and quality of service.

Read at the North Central Medical Conference, November 23, 1947, St. Paul, Minnesota.

The V.A. appointed a Medical Coordinator in Topeka, where the society has headquarters. He has teletype communication with both regional offices affecting Kansas. Everything is handled through this Medical Coordinator, a doctor.

Most rating examinations in Kansas are done at V.A. facilities, the rest are sent to specified doctors on a rotation basis. The Kansas State Medical Society has formed a medical board of review, which meets weekly, to which the Medical Coordinator brings all reports that are incomplete or unsatisfactory. These are referred back to the doctors, with recommendations by this board. Of approximately 90 rating reports a week, 15 are returned.

For out-patient treatment the veteran has free choice and authority is issued on application of the veterans doctor to the Medical Coordinator.

He believes the quality of care is at least equal to that received in a Veterans Hospital. Cooperation with the Veterans Administration at the top level was always very good. Initially, several local administrators caused trouble by using obstructionist tactics but this has been largely eliminated, in some instances apparently, by removal of the offenders.

The Medical Coordinator and the representatives of the Society spent a great deal of time in traveling around the state informing the doctors of the scope and mechanics of the program.

They are well satisfied and expect future expansion.

California. Dr. A. E. Larsen of California Physicians' Service, who operate the plan using the CPS fee schedule, stated that all pension rating examinatoins are done in V.A. facilities and the plan is limited to out-patient treatment only. They experienced considerable confusion in the early stages due to lack of understanding of the regulations, which they have to some extent eliminated by the use of mailed bulletins. The program is under the control of the California Medical Association who have reviewing committees to rule on questions of unfair practices on the part of doctors. If such are suspected, the doctor is called up for a formal hearing and may be eliminated from participation. The CPS has signed a contract with the V.A. for 1948, the present load is 10,000 cases per month and there are 8,474 doctors participating. They have excellent cooperation with the V.A., are satisfied with the plan, and feel that they have met a challenge in administration satisfactorily.

On behalf of Associated Medical Care Plans, Dr. Larsen suggested that such plans would be the most satisfactory intermediary to handle a Veterans Care program because of uniformity of administration, economy and administrative know how. They believe the program is beneficial to both veteran and the doctor, and that it will tend to preserve the private practice of medicine.

Utah. Mr. W. H. Tibbals, Executive Secretary of Utah State Medical Association, speaking for the Rocky Mountain states but apparently mainly for Utah and Colorado, expressed dissatisfaction with the entire program, enumerating all the common causes of friction and disagreement with which you are all familiar. His report showed clearly that there was a fundamental lack of understanding on the part of the profession and the Veterans Administration in that region, both as to the purposes and the scope of the program, and that the administrative challenge had definitely not been met.

New York. Dr. H. H. Bauckus, member of the A.M.A. Board of Trustees Veterans Committee, briefly outlined the situation in New York where the New York Medical Society set up a corporation to administer the program. In his opinion, the principle of free choice of physician is being rapidly eliminated from the program and he expressed disappointment mainly for this reason.

Minnesota. Dr. Ralph H. Creighton, Chairman of the Committee on Veterans' Care of Minnesota State Medical Association, represented the North Central states. He spoke of the general disappointment in that area that Part One only of the fee schedule has been approved to date, although, throughout the area operations are proceeding because of an interim agreement. He discussed the administrative problems, due to lack of understanding of the program by the doctor and the veteran, chiefly, incomplete and inaccurate requests for treatment and incomplete and faulty reports. In Minnesota this situation is rapidly improving.

Dr. Creighton expressed grave concern as to the future of the program, citing the recent half million dollar expansion facilities for out-patient care at Fort Snelling.

Dr. Paul Hawley, Chief Medical Director of the Veterans Administration emphasized the limitations placed on any program by present law, pointing out emphatically that the Veterans Administration and he himself were employed to implement the desires of Congress with the amount of money made available by Congress. Any administrator spending federal funds can do so only in the amount and for the exact purposes of his budget and such expenditure must be properly authorized. He mentioned a few abuses and fraudulent practices which had been uncovered in the program, also the difficulties often encountered in readily establishing whether or not a given illness was or was not service connected.

Dr. Hawley felt that in general the practice of having private physicians make rating examinations had not proven very satisfactory. Many reports had been delayed and were incomplete when received. Furthermore, it requires someone to adopt medical terminology so that it can be understood by a lay board. He suggested that the ideal situation might be for the V.A. to make all rating examinations and private physicians provide all out-patient care. It may surprise many of you that Dr. Hawley stated unequivocally that there is no present intention of expanding V.A. facilities to care for all of the out-patient work, that in fact, present expansion will not begin to care for the increased load and further that even if facilities are greatly expanded they will be unable to staff them. There are now 3,630 full time and 2,536 part time or fee basis physicians examining 175,000 veterans a month.

The fiscal 1948 budget estimates 1,250,000 out-patient treatments by private doctors and for the fiscal year 1949, 2,000,000. The 1948 budget estimates 858,000 rating examinations by private doctors and in fiscal 1949, 1,500,000.

It seems evident then, that the medical administrative head of the Veterans Administration expects to use the services of private doctors more and more in the next few years.

In discussing the cost of private care and fee schedule negotiations, Dr. Hawley felt that there was a tendency to present fee schedules higher than those prevailing generally in that state, that such schedules were unfair to the government and would effect a general rise in medical fees. In explaining the maximum fee schedule sent out by the Veterans Administration, he stated that it was arrived at by a prominent group of medical men acting in an advisory capacity, and further, that it was to be used as a general guide only and that they had not necessarily abided by it.

Many of us were quite surprised to hear him say that costs per each examination or treatment were three times as high for care given by private physicians as against care by a Veterans Administration facility. In arriving at this figure, all usual costs entering into care were utilized, but costs of travel, subsistence and loss of time by the veteran from his work were not considered.

It seems, then, that the Veterans Administration is satisfied with the program as a whole and expects further expansion. They are concerned over what they consider high costs and with the inadequacy of rating examination reports.

I believe that, in general, the doctors do not like the following features:

1. So much use is being made of V.A. out-patient clinics that, in metropolitan areas at least, very little work is being done by private physicians.

2. Expansion of facilities will accentuate this tendency so that the program may not be large enough to be worth while.

3. The continued provision of more beds for care of non service connected disabilities encroaches on private practice, as does the use of these beds by veterans well able to pay.

4. Administrative restrictions inherent in the program are annoying, they are chiefly: (a) Paper work, reports and securing of authorizations. (b) The difficulty and delay in establishing whether or not the illness is service connected. (c) An increasing tendency on the part of the administrators to restrict authorizations for treatment to a limited number of calls or procedures instead of leaving this to the discretion (and conscience) of the physician.

5. It has been repeatedly demonstrated that federal programs for medical care never set up a budget large enough to meet its costs. We have seen this in the Farm Security program, the EMIC program and now the Veterans Home Care program is being curtailed because of shortage of funds. Currently they are 70 million dollars short and the only solution available to an administrator is to curtail the program by limiting authorizations and by making more use of existing V.A. facilities.

6. Negotiations for final completion of the fee schedule appear to be hopelessly bogged down.

Here we have a fair cross section of opinion, not including that of the veteran, with neither party completely satisfied, the doctors least of all. It seems, from previous experience, that no federal medical proposal can be entirely satisfactory to all concerned. The apparent impossibility of decentralization and the inherent rigidity of the budget system along with all the other factors involved in federal control make a thoroughly fair and equitable program an impossibility. Nevertheless, I feel that the advantages to the veteran, to the Veterans Administration, and to ourselves are greater than the disadvantages and that we should exert every effort to carry this project on successfully. To do so calls for us to use not only our best medical ability but our best administrative and political talents as well, in order to insure that now and in the future a sound workable program is maintained, giving the maximum of service possible to the veteran with due respect for our rights as free individuals.

I think it is for us through our state and national societies to decide the pattern of future programs, and having so decided, to see that our views receive proper consideration. I believe the program should be continued and expanded so that every veteran should have free choice of physician for the treatment of any service connected disability. Further, if it is in reality the intent of Congress to provide medical care for any and all illnesses at government expense, then for this also he should have the privilege of free choice and if in the future, as is often suggested may happen, medical care is to be furnished to the veteran's family, they too should be able to go to their own physician for it.

Up to the present time, all of our contacts have been in the administrative field. We have been dealing with men who have been handed certain more or less explicit directions and a fixed sum of money to go out and arrange for provision of this care. It is, then, only a simple step forward for us to begin to deal directly with the people who draw up the program and appropriate the money, the politicians. You all know very well that expansion of existing veterans facilities arises more often because of political than administrative pressure; political pressure applied by veterans organizations, chambers of commerce, business organizations, builders, contractors, local politicians and many other groups. This being so, we as a medical profession have a perfect right to express ourselves in the political field. If we believe for instance, and I do so believe, that both service connected and non service connected cases could well be serviced in whole or in part by private physicians, then we should certainly present this conception.

Most of you remember that much of the present improvement in the structure and activities of the American Medical Association came about as a result of discussions originating in this Northwest regional conference. I would like to present for your consideration the suggestion that all feasible avenues of approach, political or otherwise, be used to further the conception of medical care for the veteran—or any other person, for that matter—to be furnished by a doctor of his own choice.

Chronic Myocarditis of Unknown Etiology

Report of a Case

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So-called "isolated" myocarditis presents a very intriguing problem to the clinician and pathologist alike in several respects. First of all, it is extremely rare. Secondly, the ante mortem diagnosis is difficult and when suspected by the clinician must be verified by the pathologist because of the obscure nature of the process.

Since the term isolated myocarditis is to many synonymous with Fiedler's myocarditis, reference to Fiedler's original description is of interest[2]: "There is an acute, rapidly occurring inflammation of the myocardium which most likely is due to micro-organisms. This same occurs, as a rule, in young people with or without fever. The pulse rate is markedly increased, and uncommonly decreased; the heart is dilated to the right and left; heart action is irregular; dyspnea, cyanosis, congestive phenomena in both greater and lesser circulation occur; and there is a marked tendency to cardiac weakness. The disease is localized mainly in the myocardium and causes there an interstitial myocarditis, the remaining organs being uninvolved or having only a secondary inflammation."

It is evident that in present-day usage, the term isolated myocarditis includes some additions to the above conception. It implies the exclusion of the generally accepted causes of myocarditis, the most common being infectious diseases, rheumatic fever, pyemia, and less commonly, syphilis, tuberculosis, and actinomycosis.[7] In addition, in the literature frequent mention is made of subacute and chronic forms of isolated myocarditis.

In an analysis of 5,626 autopsied cases, Saphir [8] states that myocarditis was encountered in 4.26 per cent, or 240 cases. Of these, only 15 cases were isolated myocarditis. Consideration of this subject would be incomplete without reference to his detailed review on the subject of myocarditis. He further states that cases of isolated myocarditis may be divided into two groups, those in which there are diffuse inflammatory lesions in the myocardium and those in which granulomatous lesions are present. He feels the term isolated myocarditis denotes inflammatory changes in the myocardium of wide variety and of varied etiologic background having in common an isolated and nonspecific involvement of the myocardium in the absence of inflammatory changes in the endocardium or pericardium and of unknown cause.

Obviously, cases will be encountered in which minor inflammatory changes in other tissues might be considered to be an etiological factor. Marcuse [6] calls attention to this possibility. From a series of 3800 autopsies he collected 36 cases of nonspecific myocarditis. In 35 of these, inflammatory lesions could be found in organs other than the heart. In 18 cases extracardiac lesions were present in the lungs only, in 8 they were found in the lungs and other organs, and in 9 in other organs only (skin, liver, kidneys, peritoneum, prostate, gallbladder, brain and meninges). Though he felt 10 cases should meet the requirements established for the isolated type, since none of the extracardiac lesions were extensive, he has the impression that myocarditis is generally connected with other inflammatory processes.

Lindberg [5] is of the opinion that isolated chronic myocarditis is less frequent in occurrence than the acute diffuse interstitial type described by Fiedler. He reports a case of isolated chronic myocarditis in a young child. The absence of any significant cellular infiltration in the myocardium is noted. He concludes that the inflammatory process responsible was primarily degenerative, with copious exudation of serum. In his opinion, acute myocarditis of the serous type may develop into subacute and chronic myocarditis.

A number of cases of isolated myocarditis are reported in children, in which microscopic sections revealed: fibrosis with small collections of lymphocytes[3]; severe diffuse myocarditis with infiltration by large numbers of mononuclear cells, eosinophiles, and neutrophiles[4]; damaged fibers with edema and infiltration by lymphocytes and elongated mononuclear cells primarily.[1]

Wells and Sax[11] report a case of isolated myocarditis probably of sulfonamide origin and cite a series of cases associated with sulfonamide therapy. Diffuse isolated myocarditis associated with dietary deficiency has also been described,[10] in which deficiency of thiamine was particularly suspected.

The highest incidence of isolated myocarditis is said to occur between the ages of 20 and 50.[9] The diagnosis must be thought of when signs of progressive myocardial failure of unexplained etiology are apparent. The course is usually rapid and response to treatment is unsatisfactory.

The following case was felt to be of special interest in view of the response obtained using only the measures routinely employed in the treatment of cardiac decompensation.

Case Report. The patient, a farmer 68 years of age, was first seen on November 17, 1947, complaining of dyspnea, orthopnea, and dependent edema. He had been in good health until February, 1946, when these symptoms first appeared. He was hospitalized elsewhere and response to treatment was good. He regained compensation and got along well for a year, with no treatment other than avoiding over-exertion. During this time he did light work about the farm.

In February, 1947, he decompensated the second time, presenting the same symptoms. He was again hospitalized elsewhere, but the response to treatment was not as good. He continued to be bothered by exertional dyspnea and orthopnea. The edema cleared, but this also reappeared several months later. During the summer and fall he had been hospitalized on four more occasions when orthopnea and edema became pronounced. Each time treatment seemed to have less effect in relieving his symptoms. On the last occasion, two weeks before his admission here, no improvement had been noted by the patient or his family.

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The family history was not significant. The patient had never been seriously ill, and there was no history of rheumatic or scarlet fever. His average weight prior to the onset of illness had been 200 pounds. System review brought out only urinary frequency of recent onset. No history of digitalis administration could be elicited.

Physical examination revealed a 68-year-old male whose weight was 194 pounds. He was dyspneic in the sitting position, pale, and appeared chronically ill. Temperature was normal. The remaining teeth were in poor repair. There were moist rales at the bases of both lungs and evidence of fluid at the right base.

The pulse was 84 per minute, bigeminal in rhythm, and the blood pressure approximately 146 systolic and 90 diastolic. There was no pulse deficit at the time of the initial examination. Auscultation of the heart revealed a loud, low pitched, blowing apical systolic murmur. The pulmonic second sound was accentuated. A short, squirting systolic murmur was audible at the aortic area. The aortic second sound was not heard, nor could a diastolic murmur be heard along the left sternal border. Both sides of the heart were enlarged to percussion, and the point of maximum impulse was in the left sixth interspace in the anterior axillary line. The abdomen could not be satisfactorily palpated since the patient was too dyspneic to lie down. The liver was thought to be palpable 5 cm. below the costal margin, and no fluid was demonstrable. There was pitting edema grade 3 (on the basis of 1 to 4) of the lower legs, and scrotal and presacral edema grade 1. Funduscopic examination revealed only grade 2 sclerosis of the retinal arteries.

Tentative diagnosis at the completion of the examination was cardiac decompensation, probably on the basis of an old rheumatic endocarditis involving the mitral and aortic valves.

He was hospitalized for treatment and the administration of a low sodium diet (less than 1 gram of sodium daily), oral potassium nitrate 2 grams with each meal, and a mercurial diuretic intravenously, was begun. Digitoxin, 0.4 mgm., was administered orally. Subsequently 0.2 mgms. of digitoxin was given daily. The patient was allowed all the water he desired. Routine laboratory tests, including urinalysis, hemoglobin determination, leukocyte count, blood sedimentation rate and serology were normal, with the exception of a grade 1 albuminuria. X-ray of the chest revealed extreme generalized cardiac enlargement (Fig. 1). A small amount of fluid was seen in the right costophrenic angle, with a zone of fibrosis in the right lower lung field. Transverse diameter of the heart was 24 cm. and of the chest 33 cm.

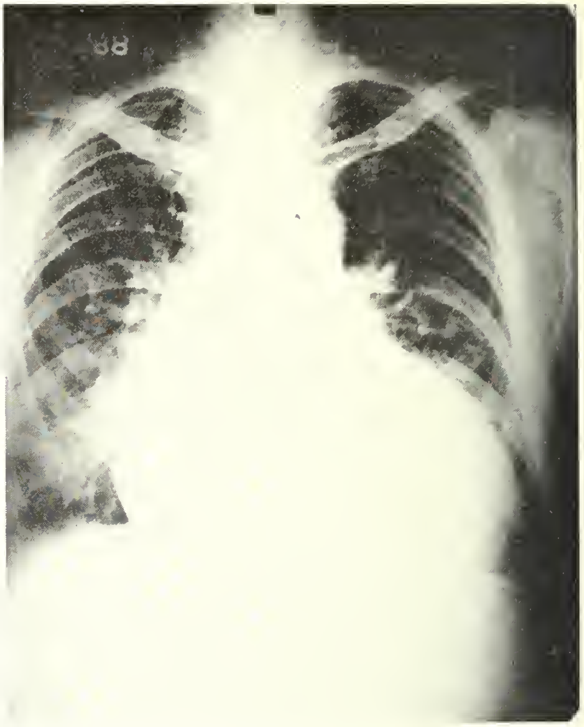

Fig. 1. X-ray of the chest revealing extreme generalized cardiac enlargement. November 17, 1947.

Diuresis was copious. An electrocardiogram was taken the next day, and revealed atrio-ventricular and intraventricular block, with occasional ventricular extrasystoles (Fig. 2). After two days of treatment 10 pounds of edema fluid had been lost. At this time the patient appeared to be fibrillating, though this was not substantial by an electrocardiogram, and now a pronounced

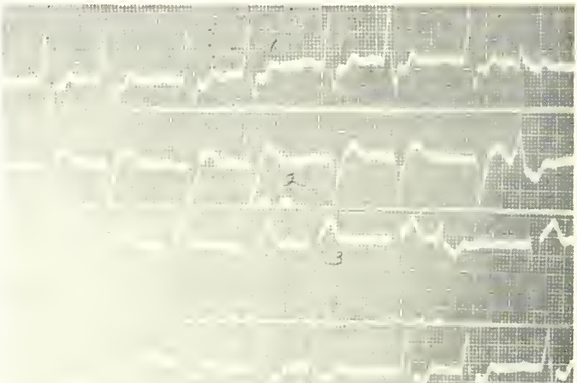

Fig. 2. Electrocardiogram revealing atrio-ventricular and intraventricular block with occasional ventricular extrasystoles. November 18, 1947.

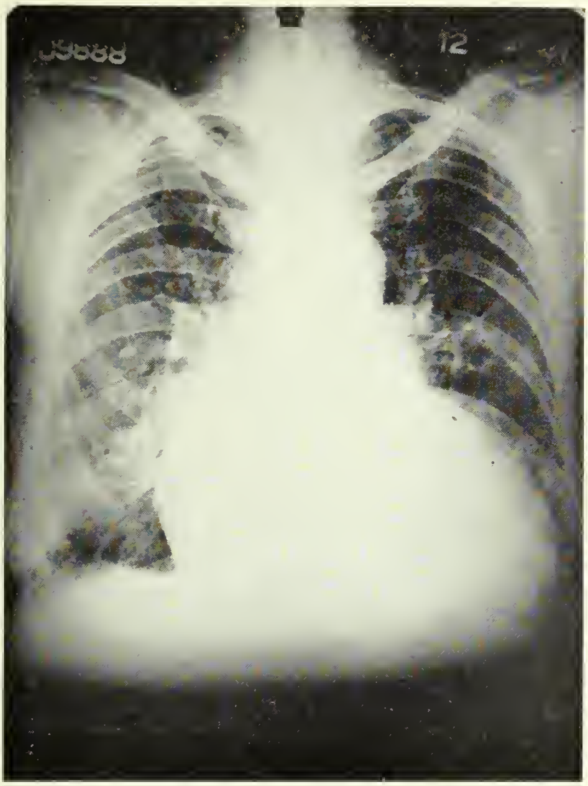

Fig. 3. Roentgenogram of the chest revealing no apparent change in the heart shadow. December 3, 1947.

diastolic murmur could be clearly heard to the left of the sternal border in the fifth and sixth interspace.

Diuresis proceeded, and he continued to improve. The left lung cleared markedly but coarse rales persisted over the right base posteriorly. This finding was attributed to a previous infarct. On November 25, 1947, he coughed up blood-tinged sputum after an attack of dyspnea. Clinical findings were unchanged. After 13 days of treatment he weighed 164 pounds, a loss of 30 pounds of edema fluid, which occurred in spite of occasional trips to the bathroom made against orders.

From this point on clinical evidence of pulmonary infarction became frequent. In spite of the diuresis the heart sounds did not improve in quality. He began to increase in weight and it was apparent that he was failing. A roentgenogram of the chest on December 3, 1947 (Fig. 3), revealed no apparent change in the heart shadow.

In the afternoon of December 8, 1947, he suddenly became very dyspneic and expired several minutes later.

Summary of Autopsy Findings

The significant findings pertained to the cardiovascular system. They are listed below:

The heart was enormously enlarged, almost filling the anterior chest. The pericardial sac contained about 50 cc. of clear fluid. On removal, the heart was found to weigh 934 grams. The aorta and coronary vessels showed a moderate degree of atherosclerosis. The aortic and pulmonary rings were greatly dilated, admitting three fingers with ease, with resultant incompetency; the leaflets, however, showed no evidence of disease. The mitral and tricuspid valves showed no abnormality except enormous dilatation. Both ventricular walls were thickened and the ventricular cavities were greatly enlarged. Examination of the auricles showed hypertrophy and dilatation, with a very large ragged mural thrombus attached within the right auricle. The deep-lying portions of this thrombus were undergoing organization, but the surface was extremely friable and fragments could be broken off easily. One particularly noticeable feature was the unusual flabbiness of the heart, the organ flattening upon being placed on the cutting board; there was also an unusual degree of pliability, the ventricular walls offering no more resistance to doubling and deformation than would wet chamois skin.

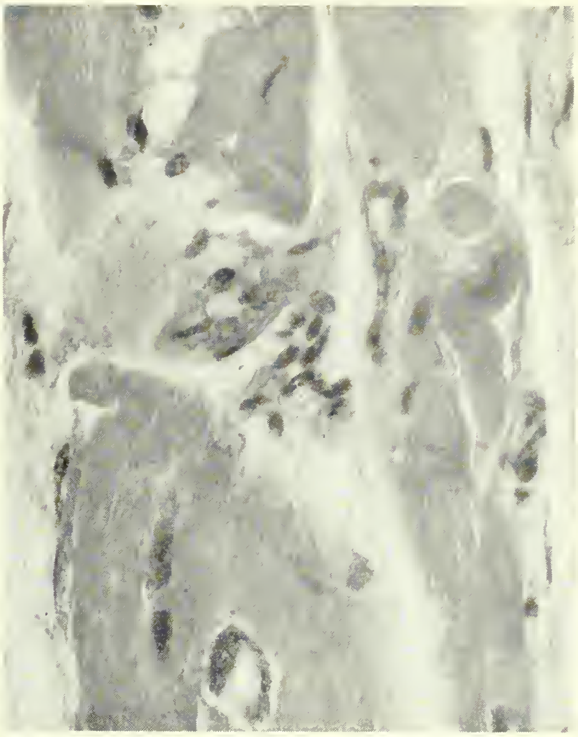

Fig. 4. Photomicrograph of section of the heart revealing chronic myocarditis.

There was complete atelectasis of the right lung, though dissection of the bronchi showed no obstruction. There was a large recent hemorrhagic infarct in the central portion of the inferior lobe. The right pulmonary artery was almost occluded by a firmly attached smooth mural thrombus which extended distally into smaller branches of the artery. This had evidently been in place for some time, since organization was well underway.

Examination of the left lung showed two recent hemorrhagic infarcts in the inferior lobe. The artery was completely occluded by an unattached mass of fibrin. It is believed that the emboli producing bilateral pulmonary infarctions and the embolus occluding the left pulmonary artery were derived from the right auricular mural thrombus.

Further examination of the body revealed no noteworthy findings.

Microscopic examination of sections from the heart showed moderate to marked interstitial edema and interstitial round-cell and mononuclear infiltration. The latter tended to occur in clusters. No polymorphonuclear cells or eosinophiles were seen. Interstitial fibrosis was not a prominent feature, though present to some degree. There was no fragmentation of muscle fibers and striae were well preserved (Fig. 4).

Sections of the lungs showed, in addition to the areas of infarction, rather marked chronic passive congestion. There were numerous amyloid deposits in the spleen and the kidneys showed chronic passive congestion in addition to nephrosclerosis of benign arteriolar type.

Examination of other organs showed only chronic passive congestion.

DISCUSSION

From the diagnostic standpoint, several features of this case deserve emphasis. Symptoms of cardiac decompensation first appeared approximately 18 months previous to the patient's final hospital admission. Since his health previously had been good, he had not consulted a doctor for many years prior to the onset of this illness. While we have no definite information regarding his previous physical condition, the fact remains that he was able to do strenuous farm work without trouble up until the onset of this illness. This, together with his rapid compensation in February, 1946, followed by a year when he was asymptomatic on moderate exertion, would seem to speak against hypertension as a probable cause of the initial heart failure.

When the nature of the illness was known, the patient's response to therapy during his final hospitalization was remarkable. Exertional dyspnea, orthopnea and dependent edema had been in evidence since February, 1947, and two weeks before he was seen, treatment elsewhere had produced no alleviation of his symptoms. Yet in a period of 13 days the routine measures used in treatment of cardiac decompensation resulted in a loss of 30 pounds of edema fluid. It was apparent at that time that something out of the ordinary was going on. A rheumatic process was considered, but autopsy findings disclosed no evidence of rheumatic involvement, old or recent. It was felt that the other causes of myocarditis had been excluded.

Another feature of this case is the extraordinary degree of hypertrophy and dilatation of the heart, in the absence of known hypertension and without valvular disease other than terminal dilatation and resultant incompetency. The microscopic picture is that of chronic myocarditis. The etiology of this myocarditis cannot be determined.

Still another feature is mural thrombosis occurring in the right auricle and the right pulmonary artery. In the former location the thrombus was undergoing organization, but the surface was ragged, soft and friable and is believed to have given rise to the emboli causing pulmonary infarction and to the massive embolus in the left pulmonary artery which apparently caused death. The thrombus in the right pulmonary artery, though very nearly occluding the artery, actually was almost completely organized and was smooth and very firm. It is noteworthy that no thrombi were found in any other portion of the body.

SUMMARY

A case of chronic myocarditis of unknown etiology is presented. Significant clinical and pathologic findings are discussed. Though a diagnosis of chronic isolated myocarditis cannot with certainty be made on the basis of clinical findings alone, it should be considered in the case of indeterminate etiology which presents: symptoms of cardiac decompensation; electrocardiographic evidence of myocardial injury; marked cardiac dilatation on the roentgenogram; unsatisfactory response to therapy.

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Mercurial Diuretics

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A great deal has been written in the past few years about the toxic reactions to the organic mercurial diuretics. It seems that their danger is greatly exaggerated, even though there have been several deaths. Occasionally allergic reactions of milder varieties occur and have been reported. Just recently there is a report by Ben-Asher on a discussion of toxic reactions on 18 cases.[1] Also, there have been other reports from time to time in the *Journal* of the American Medical Association and other periodicals.[2] These reactions have invariably followed the intravenous injection, which is the usual method of administration.

There are a number of theories to explain the mechanism of these reactions: (1) Some believe them anaphylactic in nature. (2) Others believe it to be a direct action of the mercurial on the heart muscle. (3) It is also thought to be caused by technical factors or (4) disturbance in the water and electrolyte equilibrium. Digitalis toxicity may also occur following the administration of mercurials as a result of mobilization of digitalis from the retained tissue fluids.

The reactions may be fatal or non-fatal and immediate or delayed, according to reported cases. The symptoms are various degrees of dyspnea, cyanosis, sweating, tachycardia, drop in blood pressure and mental confusion or even convulsions and collapse. Some of the reactions which the mercurials produce result from the excessive diuresis. Some patients develop no outward symptoms when they lose ten pounds of edema fluid in one day, while others may develop marked weakness and cramps with an abrupt loss of as little as two to three pounds. Such reactions require a reduction in the size of the dose. It is not established that these materials ever cause nephritis, or renal damage, and there should be no hesitation in using these compounds where a diuretic is necssary, irrespective of the state of the kidney. This is pretty much a conclusion of such men as Gold, Stroud, Levine and others.[3,4,5]

In considering the extensive use of the mercurial diuretics, the number of serious reactions reported from their use is very small and the benefits derived are great. It is this thought that I wish to make foremost in this discussion. The use of mercurial diuretics has grown steadily since their inception, and, despite occasional criticism, has proved to be one of the great advances in treatment of congestive heart failure since the general acceptance of digitalis. The great pity is that even today so many patients in desperate need of this therapy are still treated with xanthine medication. The profession has been xanthine conscious for so long that this is the first thought when ordinary treatment fails to relieve congestion. It would be far better for the welfare of the patient to displace this thought with the mercurials. It is well to emphasize the fact that a large group of beneficiaries of these newer substances are those who may have no visible palpable signs of edema. There are many cases of fairly advanced left heart failure who are subject to paroxysms of cardiac asthma or pulmonary edema but who may show no evidence of venous congestion between the attacks. The appropriate continuous use of organic mercurials enables these patients to carry on satisfactorily without discomfort.

In the past few years I have markedly increased my use of Salyrgan and related compounds in congestive heart failure with what I believe has been a great benefit to these patients and without complications. I wish to cite two cases as illustrative. The first is that of a female who came under my care in March, 1937, at the age of 45 years. She had a mitral type of heart disease and had cardiac dyspnea and asthma with varying degrees of edema as her symptoms. She had albuminuria most of the time. In October, 1945, she died with a complicating virus pneumonia, seven years after I first saw her. During the last five years of her life (from 1940 to 1945) she had a total of 119 injections of Salyrgan which certainly prolonged her usefulness and greatly enhanced her comfort. The second case is that of a male, age 58, who is under my care at present. This man has a combined hypertensive and valvular heart disease as well as diabetes mellitus. He, too, has albuminuria; considerable dyspnea as well as edema are his distressing symptoms. The usual oral or rectal diuretics have not been effective in his case. He is a peculiar type of individual who is prone to do as he pleases most of the time; however, one thing is definite in his mind and that is the fact that he obtains great relief from the injections. From 1945 to the present time he has had 137 intravenous injections of Salyrgan with no untoward effects.

The oral diuretics, such as ammonium chloride or aminophylline and theophylline, on the whole are not very satisfactory. They rarely take the place of the organic mercurials in patients who are in need of effective diuresis. Salt restriction is one of the most important single measures in the control of heart failure. The average daily diet contains about 10 grams of salt. Patients in heart failure are often incapable of excreting more than 2 or 3 grams of salt per day. The result is that they retain salt and in consequence of this the volume of extracellular fluid increases, which of course, in turn gives rise to edema. The most successful way of restricting salt intake to about 1½ grams per day is to limit the diet to a quart of milk a day as does Levine.[5] This is particularly important in the early days of the management of an acute or far advanced heart failure, and later a strict low sodium diet may be followed.

Water restriction in heart failure is not necessary since

Read at the North Dakota meeting of the American College of Physicians at Bismarck, September, 1947.

*From the Grand Forks Clinic, North Dakota.

it is rare that these patients will retain water in the face of rigorous restriction of salt intake. In point of fact, water acts as a diuretic and several liters of water a day with a restricted salt intake will not lead to edema but to loss of edema.[6,7,8] The use of water for diuretic purposes is not very practical because of the inconvenience of taking such large quantities. But it is the general practice now of most authorities to allow patients to take water without restriction and to encourage them to take at least 1½ to 2 quarts per day.[9]

There are various reasons for failure of physicians to make full use of mercurial diuretics. It is simpler to give the patient tablets by mouth than to use injections. From time to time various reports from the literature of sudden death following the intravenous use of these substances has distracted some from the more frequent use of them. Recently an article reviewing mercurial diuresis and sudden death following the intravenous injections has appeared.[2] This report carefully summarizes the clinical and laboratory findings in three patients and presumably covers all available material from a large hospital and private practice over a period of six years. Although the expressed purpose of the paper is to emphasize the danger of intravenous mercurial therapy, the statement is made that intravenous injection of mercurials should not be discontinued but that realization of danger of their use must ever be present.

In my opinion, some of these articles and reports greatly over-emphasize this factor, although there is no doubt in my mind that it is a justifiable caution even though I have yet to meet with a reaction of this type. As another author expresses it, "the great boon of mercurial diuresis must not be withheld through these unfortunate technical reactions which are independent of the pharmacal dynamics of the drug."[10] Many physicians have had the experience of delaying an intravenous mercurial injection until the following day, only to learn that their patient had died suddenly at some time during this interval.

The action of mercurial diuretics, while not completely understood, seems to be mainly upon the kidney tubules and temporarily inhibits their normal reabsorbing powers. Thus, a large quantity of the glomerular filtrate is available for excretion and the total kidney output is increased. These preparations are usually given intravenously in the amount of 1 to 2 cc. after a preliminary test dose of ½ cc. to determine individual idiosyncrasy. If the patient is quite seriously waterlogged it is advisable to proceed rather conservatively. The injection may be repeated every day in some cases, however, I personally do not wish to repeat it more than every other day. The injection should be made slowly, taking two to three minutes for the procedure. The present day materials may be injected deep into the buttocks and rarely cause much pain or local reaction. However, when giving them intravenously one must be sure to inject directly into the vein because a little of the material outside the vein causes rather severe local reaction.

Suppositories are available and also oral tablets are now obtainable, but in my experience, these preparations are not very satisfactory. The latest report of the use of the mercurials orally that has come to my attention is that of Batterman et al.[11] of New York University who used it in a series of 81 patients in 1946. They concluded that this method of administration is not reliable, and does not give the satisfactory diuresis that results from the intravenous route.

Naturally, I do not have enough time here to discuss the complete treatment of cardiac patients with congestive heart failure. However, it consists principally of (1) the regulation of the fluid and the salt balance, (2) the use of mercurial diuretics, and (3) digitalis. The daily use of diuretics, or the biweekly use of mercurial diuretics goes a great distance in accomplishing good results in these cases. Many persons with a bad congestive heart failure can be adequately treated in the clinic. No claim is made that the patients are cured, or even that their lives are prolonged by this regime, but they can be kept fairly comfortable, permitting them to remain at home instead of in an institution.

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Summary of Public Health Needs in North Dakota*

Report of a Study by the American Public Health Association (Aug.-Sept., 1947)

Need for Full-Time Health Departments

Even the most casual observation of the public health facilities and programs would lead to the conclusion that North Dakota's greatest public health need is for more full-time, adequately staffed local health departments. This is unquestionably the paramount need if North Dakota is to attain the maximum in health and happiness for its people.

The major emphasis of this report is, therefore, placed upon the attainment of this objective—full-time adequately staffed local health departments covering the entire state.

At present, North Dakota has appropriations for two full-time health districts, or, as many prefer to term them, multiple county health departments. They are the First District Health Unit, comprising Ward, Burke, McLean, and Renville counties, including Minot, and the Southwestern District Health Unit, including Bowman, Hettinger, Adams, Billings, and Golden Valley counties. The total population served by these two full-time health departments is approximately 74,000, or 13 per cent of the total population for the state, estimated at 537,084. Actually, because of a loss of practically all its personnel, the Southwestern District Health Unit is not functioning as a full-time health department. The population of the First District Health Unit, with headquarters in Minot, is estimated as 52,567, which means that actually, at present, only 9.8 per cent of North Dakota's population is receiving full-time public health service. The counties of Divide, Williams, and McKenzie are now in the process of being added to the First District Health Unit. (The estimated population of these counties is 25,500.) This will bring the total population covered with full-time public health service to about 78,000 or 14.5 per cent of the total for the state.

Thus, even with the additional coverage which is now being developed, the State of North Dakota will still leave 85.5 per cent of its population without full-time health service. This is the fundamentally important problem which needs solution.

As previously stated, the ways and means of solving this problem will be the major objective of this study.

Basic Essentials for Attaining Health Needs

There are at least five basic essentials to the attainment of full-time, adequately staffed local health departments. They are:

1. A comprehensive, well-planned state-wide program of health education or health information. (This program is of the utmost importance in the attainment of the other four basic essentials.)
2. A strong State Department of Health. Experience has shown that the development of and strength of local full-time health services is very closely correlated to the leadership and strength of the State Department of Health.
3. State legislation permitting and facilitating the establishment of full-time local health departments, city-county, county and multi-county, with a single board of health and a single fiscal agent.
4. Adequate personnel in terms of well qualified professional, technical, and clerical persons to staff local full-time health units.
5. Good salaries which will permit the recruitment and retention in service of qualified personnel, such as indicated in the preceding fourth basic essential.

North Dakota's Strengths and Weaknesses in Relation to Basic Essentials

1. *Health Education.* The North Dakota State Department of Health does have a well-trained health educator and the program in so far as it goes is good, but it is necessarily limited by the fact that only one person is devoting full time to this basically important function.

The State does not as yet, have a comprehensive, well-planned, state-wide program of health education or health information designed to achieve the objective of full-time health coverage for the state. That this is true would seem to be well attested to by the fact that at present, only one full-time health department is functioning in the entire state. At least two additional well qualified health educators are needed.

2. *A Strong State Department of Health.* The North Dakota State Department of Health has a well-trained, capable State Health Officer and the other important functional activities which are filled are manned by capable, well-trained persons, but there are several important unfilled positions and some important activities which are not covered at all.

At present the State Department of Health has but one full-time physician trained in public health—the State Health Officer himself. Even in a state of fairly low population, this is far below what should be expected. The State Health Officer at present is responsible for the general overall administration of the department, and for the acute communicable diseases, tuberculosis,

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The health study, of which this is a report, was made at the request of the State Health Council and the State Health Officer. The request also had the approval of the State Health Planning Committee. The study was made by the American Public Health Association through its field personnel with Carl E. Buck, Dr.P.H., as Field Director. It has been made without cost to the state of North Dakota through a grant to the American Public Health Association by the Commonwealth Fund for the purpose of conducting health studies in a few carefully selected states. This, and other state surveys, are made under the sponsorship and supervision of the sub-committee on State and Local Health Administration of the Committee on Administrative Practice of the American Public Health Association. The statements in this report are those of the field staff and do not necessarily represent the opinion of the American Public Health Association or its Committee on State and Local Health Administration.

*In this summary an attempt has been made to present the most salient points of the comprehensive report.—Editors.

venereal diseases, maternal and child health, and hospital and medical care administration. It is obvious that no one person, no matter how capable, can do justice to so many important activities. At least three additional well-trained physicians are needed.

Public Health Dentistry is not covered at all, and Mental Health, Cancer, and Health Education need further development. As the Hospital and Medical Care program progresses, it seems certain that more medical direction and supervision will be needed. Maternal and Child Health, and Crippled Children's services are practically without medical supervision; they should have qualified medical supervision.

Until very recently, the State Health Council appointed the State Health Officer. Recent legislation has reorganized the State Health Council from five to nine members and has changed the manner of appointing the State Health Officer. At present the State Health Officer is appointed for a four year term of office by the Governor. This creates the situation of having the Health Officer appointed by the Governor, but responsible to the State Health Council. The present prescribed qualifications for the State Health Officer are inadequate and do not prevent the appointment of an unqualified person.

Apparently neither the State Department of Health nor the State Department of Public Instruction have as much authority and responsibility as they should have regarding the location, construction, and equipment (heating, lighting, ventilation, seating, water supply, and excreta disposal) of schools, particularly rural schools. There is no basic legislation which gives the State Department of Health the authority to approve swimming pool construction, equipment or location.

There are a number of important deterrents to obtaining qualified public health personnel. Among them are inadequate salaries, too low travel allowances (at present 5 cents per mile of automobile travel), the financial hardship (sometimes insurmountable) involved in the necessity of purchasing automobiles by such personnel as public health nurses and sanitarians (who are at best paid modest salaries), and the location of work.

It is extremely difficult, and sometimes impossible, to get trained public health personnel to accept positions in remote rural areas. This presents a very realistic problem.

Another barrier to the recruitment of qualified personnel is the present ruling of the merit system that any person certified in a given grade must be employed at the beginning salary of that grade, even if the individual being considered possesses considerably more than the minimum qualifications. This problem is now under consideration by the Merit System Council, and it is greatly to be hoped that the present ruling will be changed.

The control and supervision of milk and dairy products, other foods and food products, food handling establishments, and meats and meat products constitute a very complicated administrative and functional problem.

Some plan of administrative reorganization which will "streamline" administration and facilitate effective co-ordination is indicated.

3. *Basic Legislation.* Basic state legislation permitting and facilitating the establishment of full-time local health departments was enacted in 1943, Senate Bill No. 77, and is, on the whole, good. Some amendments to strengthen the act may be desirable, particularly as related to financing.

The State, at present, appropriates *no funds* for financially assisting full-time local health departments.

4. *Adequate Qualified Personnel.* There is no backlog of qualified professional and technical personnel in the state to man such full-time health departments. As already pointed out, even in the State Department of Health, several important key positions are today unfilled and have been for some time.

5. *Good Salaries.* With few exceptions public health salaries in North Dakota are not good. Salaries are not sufficient to permit the recruitment and retention in service of capable, well qualified professional public health people.

MAJOR RECOMMENDATIONS

The following recommendations are made to meet the five basic essentials for assuring adequate full-time health protection and health promotion services, locally administered and substantially financed through local funds.

1. That at least two well-trained health educators be added to the staff of the Division of Health Education to exert their major efforts toward hastening the sound development of full-time local health departments.

2. That the State Health Council (to whom this report is officially made) nominate or suggest 12 or 15 persons to act as the steering committee for the establishment of a state-wide health committee, and that either the Governor be requested to invite, or that the State Health Council itself invite, this group to meet for the purpose of establishing such a state-wide health committee.

3. That the Health Education Division of the State Department of Health offer its services to, and work in close co-operation with the state-wide health committee.

4. That the State Department of Health be reorganized as recommended in the proposed organization chart.

5. That a well qualified medical epidemiologist be employed as the Director of the Division of Disease Control.

6. That a well qualified public health physician, with special training in pediatrics or obstetrics, and, if possible, with experience in hospital administration, be employed as Director of the Divisions of Maternal and Child Health, including crippled children and nutrition and hospital and medical care administration.

7. That a well qualified public health physician with training and experience in health administration be employed as a field epidemiologist, and that he be the field representative of the Division of Disease Control.

8. That the crippled children's services now being carried on by the Division of Child Welfare in the Board of Public Welfare be transferred to the State Department of Health.

9. That a Division of Public Health Dentistry be established in the State Department of Health with a well qualified public health dentist as its director. This proposed division should formulate its program in close cooperation with the Public Health or Public Relations committee of the State Dental Association, but in any event, its major emphasis should be placed on reaching very young children, and upon a program of postgraduate training in children's dentistry for dentists.

10. That present legislation be amended to provide that to be eligible for the position of State Health Officer, a person must be a graduate of a Class A medical school and must be licensed or eligible for license to practice in North Dakota, and that he shall have had at least a year of curricular training in an accredited school of public health, plus a minimum of two years experience in a full-time administrative position in an approved health department or other approved health agency,

or, in lieu of curricular training in public health, he shall have had at least five years experience in a full-time administrative position in an approved health department or other approved health agency. The decision as to whether or not a health department or other health agency is approved shall rest with the State Health Council.

11. That present legislation be amended to provide that the State Health Officer be appointed by the State Health Council for a period of five years from the date of his appointment, provided he meets the qualifications as established for that position.

11a. That the Governor upon the recommendation of the State Health Council appoint the State Health Officer for a period of five years from the date of his appointment, provided he meets the qualifications as established for that position.

12. That the salary of the position of State Health Officer be not less than $10,000.00 per annum.

Recommendations 13-15 deal with Environmental Sanitation.

16. That present legislation permitting counties to levy a tax of one-half mill on 50 per cent of each one dollar of assessed valuation for public health, be changed to permit a levy of not to exceed one mill per each dollar of assessed valuation.

17. That the state legislature be asked to appropriate not less than $100,000.00 per annum to assist in the development of full-time city-county, county or multi-county health departments, allotments to be made to individual full-time units only, by the State Department of Health in accordance with such criteria or formula as may be established by the State Health Council.

Recommendations 18-22 deal with Public Health Personnel.

. . . MEET OUR CONTRIBUTORS . . .

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Melvin E. Koons, M.P.H., Grand Forks, Director, Division of Public Health Laboratories, North Dakota State Health Department, and Associate Professor, Public Health, University of North Dakota, has been associated with the State Health Department for 14 years; received a B.S. degree from the University of Maryland, M.Sc. degree from Pennsylvania State College, M.P.H., Johns Hopkins School of Public Health and Hygiene, and a graduate course in Tropical Medicine, Army Medical School; Fellow, American Public Health Association; member, Sigma Xi, Society of American Bacteriologists, American Association for the Advancement of Science, North Dakota Academy of Science, American Society of Professional Biologists; Secretary-Treasurer, Conference of State and Provincial Public Health Laboratory Directors.

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Frank R. Moore, M.D., is Associate Physician of Health Service, Ohio University; specializes in Internal Medicine; graduate of Duke University, class of 1937; member, A.M.A.

Eileen Phillips Westfall, M.D., is now married and a medical resident in pediatrics in Tucson, Arizona; was associate physician at Ohio University for 1½ years; graduate of Ohio University, class of 1942; member, A.M.A.

Alexander G. Ruthven, President, University of Michigan, received his Ph.D. from the University of Michigan in 1906; has been awarded 10 honorary degrees from various colleges and universities throughout the country.

The Status of North Dakota's Plasma Program

Melvin E. Koons, M.S., M.P.H.
Grand Forks, North Dakota

THE North Dakota State Health Department through its Division of Public Health Laboratories has, we believe, shown conclusively that a state-wide free plasma program is not only feasible but is also practical and results in the saving of many lives. It has also demonstrated, however, that the operation of such a program can be successful only so long as an adequate source of human red blood cells is available.

In March, 1944, the State Legislature appropriated funds to the State Health Department to set up and finance a free plasma service. These funds were augmented with money from the U. S. Public Health Service and a program was established to furnish dried plasma to anyone in the state, free of charge. The program embraces the procurement of blood from volunteer donors, its processing into the dried state, and its distribution as a complete package on a state-wide basis. The original purpose of the program was to help save civilian lives in North Dakota. This purpose was achieved from the beginning and the program has been accepted wholeheartedly and enthusiastically by both the State Medical Association and the State Hospital Association. There is no doubt but that the use of plasma has resulted in the saving of many lives and has resulted in better pre-operative and post-operative care of surgical patients.

VOLUNTEER BLOOD DONOR CLINICS

Blood is procured from volunteer donors only, without the payment of a fee. Prior to the institution of the program, no public donor clinics were ever held in North Dakota, although the people naturally had heard and read of the National Red Cross blood collecting program for the Armed Forces.

The enrollment of donors has always been a local function. A date for holding a clinic is generally decided upon by the director of the program and then it becomes a local project. The sponsoring agency, usually the local hospital or some civic or commercial organization, is responsible for the enrollment of donors, registration of donors at the clinic, furnishing of volunteer help at the time of the clinic, selection of a suitable place for the clinic, the canteen service and all publicity.

In July, 1945, the American Red Cross announced a new policy governing the participation of Red Cross chapters in civilian blood donor services. There had been a widespread demand that the Red Cross, because of its association with the procurement of blood for the Armed Forces and out of the abundance of its experience, render a similar service to the civilian population. The question was carefully considered by all parties concerned, with the result that a policy of chapter participation was finally announced. Briefly, the policy stated that chapters of the American Red Cross desiring to do so may participate in civilian blood donor services only upon the receipt of authorization from the Area Manager. North Dakota's program was given the approval of the American Red Cross and an arrangement was made whereby local chapters in the state may cooperate with the Health Department program as an assisting agency. Donor clinics have been scheduled to meet the needs of the state; therefore, since the acquisition of surplus plasma from the Red Cross (note later) only occasional clinics have been held.

Since the beginning of the program, eighty-nine volunteer blood donor clinics have been held in thirty different communities. As noted on the Map, these clinics have been fairly well scattered throughout the state. They have been sponsored by local hospitals, civic and commercial organizations and, lately, by local chapters of the American Red Cross. Clinics have been held in local hospitals, memorial buildings, churches, schoolhouses, and fraternal club rooms. All help at the clinics has been volunteered and local physicians have procured the blood in all instances.

TABLE 1
Total Donor Registration

August - December, 1944	1,423
January - December, 1945	2,548
January - December, 1946	771
January - August, 1947	540
Total Registration	5,282

Table 1 shows the total number of persons registered at the clinics since August, 1944. As pointed out before, not many clinics have been held since December, 1945, due to the availability of surplus war plasma obtained without cost through the American Red Cross. As noted, a total of 5,282 people has been registered at the donor clinics.

TABLE 2
Results of Donor Clinics

Classification of Results	Donors	Percent
Satisfactory full samples[1]	3,879	73.6
Partial samples[2]	478	9.0
No blood[3]	339	6.4
Unsatisfactory samples[4]	257*	4.8
Rejects[5]	329	6.2
Total Registered	5,282	100.0

[1] 500 cc. whole blood—all samples used in plasma preparation.

[2] 200-350 cc. whole blood—all samples used in plasma preparation.

[3] An attempt was made but no sample procured.

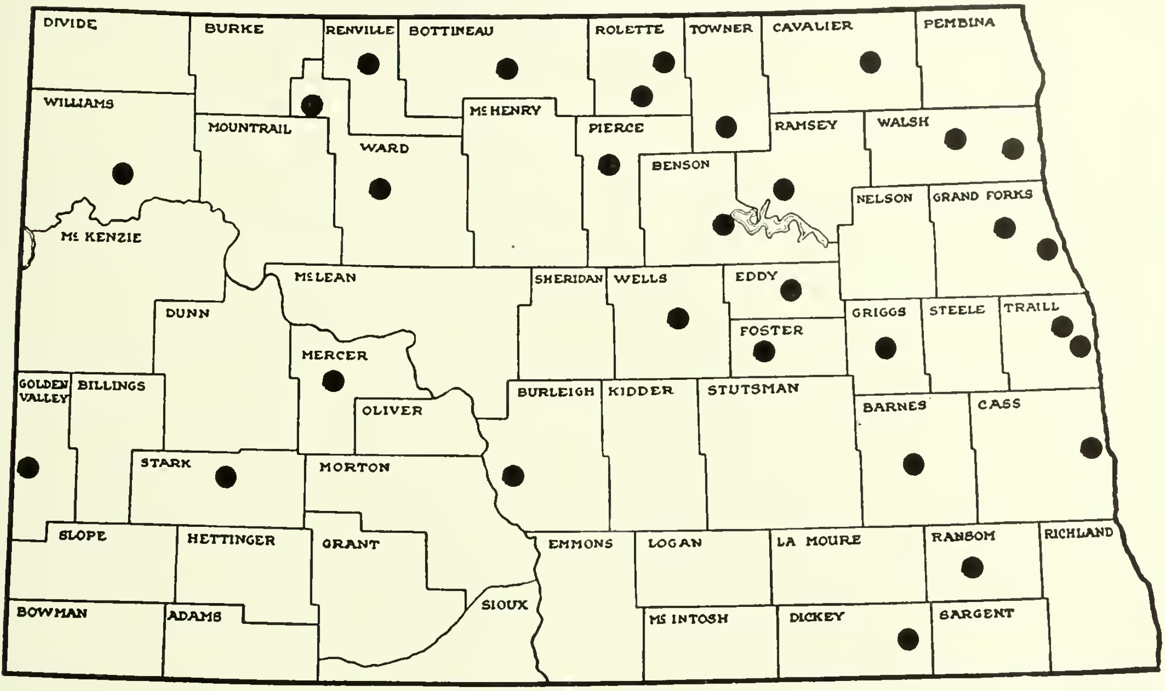
[4] Hemolyzed and/or chylous, positive serology—samples not used.

[5] Rejected at time of physical examination.

*150 full samples, 107 partial samples.

Table 2 shows the actual results obtained from a registration of 5,282 donors. A total of 329, or 6.2 per cent of the donors, was rejected for various reasons and no

LOCATION OF VOLUNTEER BLOOD DONOR CLINICS IN NORTH DAKOTA



attempt was made to procure blood from these individuals. Satisfactory full samples were obtained from a total of 3,879, or 73.6 per cent, and also satisfactory partial samples were obtained from 478, or 9.0 per cent of the donors. On 339, or 6.4 per cent, an attempt was made to procure blood with failure—in a majority of these instances the individual had small veins. There were 257, or 4.8 per cent of the samples which could not be used at the time of the pooling because they were too chylous or too hemolyzed. Also included in this number was 13 samples which were discarded because they gave positive serologic tests for syphilis. Of the 257 unsatisfactory samples, 150 were full samples and 107 partial.

TABLE 3
Status of Blood Procurement at Clinics

	Donors	Percent
Full samples	4,029	81.3
Partial samples	585	11.8
No blood (failures)	339	6.9
Total Vein Punctures	4,953	100.0

Because of the system used in the North Dakota plasma program, Table 3 is of particular interest. Under the present program, local physicians in the community where the clinics are held do all of the actual bleeding. As indicated, from the 4,953 donors who were admitted to the clinics, a total of 4,029, or 81.3 per cent, full samples was obtained. Partial samples were obtained from 585, or 11.8 per cent of the donors. The most significant thing shown in this table is that only 339, or 6.9 per cent, were failures. In other words, in 93.1 per cent of the cases the local physicians were successful in obtaining samples which theoretically could be used.

As an added service in connection with the program, all donors are typed for blood group and all future donors will also be typed for the Rh factor. Each individual is given a card indicating that he is a voluntary blood donor to the North Dakota blood donor service and on the card is also listed his blood type and Rh factor. A list of the donors is sent to the local hospital. This serves a twofold purpose; the donor knows his type of blood and Rh factor in the event that he has to receive or give a whole blood transfusion and the hospital has an available list of potential donors in the event that a whole blood transfusion is needed for some emergency.

In 1946 more than 2,000,000 pints of plasma were declared surplus to the needs of the military. They were returned to the American Red Cross for free distribution through state health departments for civilian use. North Dakota received its first allotment of this surplus plasma in February, 1946. Because of the availability of this surplus plasma, the state program has been somewhat curtailed; however, some clinics were held in order to keep the program active. With the end of the surplus plasma coming in sight, it will be necessary to have a good reserve of state plasma on hand so that transition back to an active state program can be made without disrupting the service. The acquisition of the surplus plasma enabled the State Health Department to (1) supplement its own program, (2) put on an educational program to inform everyone of the importance of plasma in the civilian practice of medicine and, (3) cover a larger area of the state with available plasma. A definite demand for plasma has been created, as indicated by its use (note later) and in order for the Health Department's program to serve its original purpose donor clinics have to be greatly increased when the program is reactivated on a full time basis.

DISTRIBUTION AND USE OF PLASMA

For a program of North Dakota's type to be successful, the product must be available to as many people as possible at all times. Therefore, the first objective of the program was to make supplies of plasma available in every part of the state. Under the state program plasma was located in 44 hospitals, 3 drug stores, and the offices of 31 private physicians, making a total of 78 depots in 49 of the state's 53 counties. Since the acquisition of the surplus plasma from the Red Cross a much wider distribution has been attained. At the present time plasma supplies are located in 50 hospitals, 3 maternity homes, 3 health units, and the offices of 89 private physicians, making a total of 145 depots in 50 of the state's 53 counties. The three counties which do not have a supply of plasma do not have a physician. These depots constitute our mobile reserve which can be shipped to other communities to meet emergency needs. Such a wide distribution is important if the program is to serve its purpose—that of having plasma available to everyone when the need arises.

When the free plasma service was first instituted in North Dakota there was some doubt as to how much plasma would be used by the medical profession. A preliminary survey of the use of plasma in the state showed that very little was being used and that only in the larger cities. Prior to the war, the medical profession at large had little opportunity for personal experience with the use of plasma—its value had not been adequately proven nor had the results of its use appeared too extensively in the literature. Then too the use of commercial plasma was restricted somewhat by its high cost. The successful use of plasma by the Armed Forces during the war period has resulted in a widespread demand that this material be made available to the civilian population.

The first units of plasma prepared under the state program were used on August 27, 1944; since then a total of 9,204 units of plasma has been used in treating 4,980 patients. Of this total, 2,780 units have been state prepared and 6,424 units have been surplus Red Cross plasma. Plasma has been used in 43 counties, which is gratifying as it shows that plasma is being used not only in the urban centers, but also in the rural areas and smaller communities. Since the beginning of the program there has been a steady increase in the use of plasma, as indicated by the fact that in the year 1947 4,196 units of plasma were used—this is 45.5 per cent of the total amount used since the beginning of the program. This increase in the use of plasma probably can be accounted for first by a better understanding by the medical profession of the value of plasma, second by the return to the state of medical men who have served with the Armed Forces, where they became accustomed to using plasma, and, third by the general availability of plasma for use when needed.

Judging from the use of plasma, we can assume that a demand has been created and it is estimated that the state will use around 4,500 units each year. This means the production of approximately 6,000 units of plasma per year when the surplus Red Cross material is no longer available.

FUTURE OF THE PROGRAM

The future status of the state's plasma program is a matter of much concern to those charged with its administration. As pointed out previously, the program, insofar as plasma production is concerned, has been more or less inactive during the past year. However, as the end of the surplus plasma comes in sight, the state's program must be reactivated. The demand for free plasma on a state-wide basis has been established and the State Health Department must be in a position to keep this service as an important medical aid to the people of the state.

The course to follow in reactivating the program is a matter for conjecture because of the recent announcement of the proposed establishment of a National Blood Program of the American Red Cross. The important questions of how this national program will affect North Dakota and how far we should go in re-establishing our program have to be answered.

For several years the American Red Cross has been studying the problem and feasibility of establishing some type of program to help supply blood needed to safeguard the health of the people of the nation. The goal of the new National Blood Program of the American Red Cross is to provide for medical use, without charge for the products, sufficient blood and blood derivatives throughout the nation to help save lives and prevent needless suffering. This program was adopted in June, 1947, as an activity of the American Red Cross.

In a brochure published July 17, 1947, called "The National Blood Program of the American National Red Cross," it is stated that there are "four distinct phases involved in supplying blood and blood products for medical use:

1. Collecting blood
2. Processing it for use as whole blood and blood derivatives, including packing and storage
3. Distribution of both the blood and the blood products for use by physicians and hospitals for any patients needing them
4. Continuous research and investigation of the quality of the products, their safety, and important uses."

In the same publication, the Red Cross summarizes its proposed program as follows:

> "A program of such magnitude must of necessity be one of gradual development. Time will be required to organize the work, to procure and train personnel, and to obtain equipment which is in short supply. The first year of operation contemplates the establishment of 20 or 25 centers carefully selected with relation to the advantages they offer in the early stages. It is estimated that from three to five years will be required before the program is in full operation. In the meantime, local programs will continue on their present basis, and new programs will be established as heretofore with the expectation of integration with the national program later on. In this way, full benefits from the fractionation phase of the program will be available

to those communities where only whole blood and plasma are now being provided.

In addition to whole blood and plasma, the National Blood Program will provide other blood derivatives of proved value: serum albumin, used for shock and certain kidney diseases and other conditions; immune serum globulin, for modification or prevention of measles; antihemophilic globulin, effective in the treatment of hemophiliacs, or "bleeders"; blood grouping serum, for determining blood types; fibrin film, used in brain and nerve surgery; red cell suspensions, for treating certain anemic conditions; and red cell paste and powder, to promote the healing of certain wounds. Any other products which continuing research may find useful in medicine and surgery will be provided.

Since people in rural districts require blood as well as those in cities, the program must be sufficiently flexible to meet widely varying conditions and needs in large and small communities throughout the country. It is the ultimate goal to collect blood from volunteers from every community everywhere and to give every healthy person an opportunity to make a contribution at least once a year. For those people to whom a blood donor center is not available, it is planned to provide the services of a mobile unit.

Under certain conditions, it may be expedient to type the donors in a community and have them available when whole blood is needed in an emergency situation. In other instances, plasma or serum albumin and other stable derivatives will be made available and tide cases over until whole blood can be transported from a central depot where all types are constantly on hand. In this way the program will be enabled to fulfill its purpose to furnish blood, blood plasma, and all of its derivatives to all the people of this country irrespective of race, creed, color, or financial ability to pay. The only charge ever made to any patient will be a reasonable one by the physician or hospital for professional services in administering the material. The Red Cross will make no charge.

That part of the program which deals with collecting blood will operate substantially along the same lines as the wartime blood program, with established blood donor centers and with mobile units to cover outlying communities. Red Cross chapters will assume the important responsibility of complete community organization to enroll blood donors and will arrange for the bleedings as needs require. In addition to the competent professional personnel for technical work, many volunteers will be necessary for non-technical work in the centers."

As one can readily see in the brief outline given here, time will be required before the proposed national program can become an overall service to reach all the people of the nation. In the meantime, as the national program develops, North Dakota must reactivate its own local plasma service. When the state program was first set up it was developed on the basis of using about 2,500 units of plasma per year; however, this total will have to be greatly increased to serve the present and anticipated needs of the state. This will mean more personnel, more supplies, and a much larger state appropriation for financing the program. Thus far we have been able to operate a small program because we have been supplied with surplus plasma, but with the funds available at the present time the program could not possibly begin to supply the actual needs of the state. The whole question of how much we should increase our program resolves itself to the fact that we must have a good estimation of when the national program will reach the state. The State Legislature will think seriously regarding an increased appropriation for the state program in view of the forthcoming national program. No definite decision can be made at this time regarding the future plan of action; however, regardless of the cost the program must be continued. The actual value received from the cost of a program of this type cannot be estimated, for there is no way to determine the value of lives saved.

The state program has been a success and if it is to continue to be so a strong educational program will have to be promoted in the state in order to secure volunteer donor quotas. Adequate donor procurement will be a difficult problem. During the war we heard so much about plasma that people were "plasma conscious" and responded readily to clinics; however, since the end of the war the difficulty of obtaining donors has been noticeable. In most instances the donor clinics have been successful, although in too many instances clinics have been cancelled because of the lack of donors. Our experience has shown that failure to procure sufficient donors has been due to a lack of adequate publicity on the local level.

At the moment we must take steps to reactivate the state program on a much larger scale and at the same time watch with a great deal of interest the development of the National Blood Program of the American Red Cross.

NATIONAL GASTROENTEROLOGICAL ASSOCIATION MEETING

The National Gastroenterological Association will hold its Thirteenth Scientific Session at the Hotel Pennsylvania in New York City on June 7-10, 1948.

In response to popular request the program this year will again for the most part consist of Symposia and there will be one Panel Discussion.

The program for the first three days will be at the Hotel Pennsylvania and will consist of Symposia on Gastroduodenal Ulcer; Ulcerative Colitis; Jaundice and Metabolism, Nutrition and Allergy. The Panel Discussion which will be followed by a "question and answer" period will cover the topics of Diabetic, Tubercular, Psychisomatic and Cardiac Manifestations in Gastrointestinal Diseases.

The fourth day of the session will be devoted to a clinical day at cooperating hospitals in New York City.

At the Annual Banquet to be held on Tuesday evening, June 8, 1948, the winner of the National Gastroenterological Association's 1948 Cash Prize Award Contest for the best unpublished contribution on Gastroenterology or an allied subject, will receive the prize of $100.00 and a Cetrificate of Merit.

Further details and a copy of the program may be obtained by writing to the Secretary, National Gastroenterological Association, 1819 Broadway, New York 23, New York.

First Days in the History of the North Dakota State Medical Association*

The North Dakota Medical Society had its birth in 1887. Dr. C. D. Conkey of Larimore, Dr. J. G. Millspaugh, of Park River, Dr. F. G. Lundy, of Inkster, Dr. A. P. Rounsevell, of Larimore and Dr. John Montgomery, of Ardock, met in an informal way and a temporary organization was effected with Dr. Millspaugh as President and Dr. Montgomery as Secretary and Treasurer.

The permanent organization was completed in May of the following year at Grand Forks. The officers elected were: President, J. G. Millspaugh; Secretary, J. E. Engstad; Treasurer, A. P. Rounsevell. A committee consisting of Drs. Hamilton, Lundy and Millspaugh, was appointed to draft a Constitution and By-Laws which were presented at the next annual meeting at Larimore, May 22-23, 1889, and there adopted.

At the Annual Meeting of the Society at Bismarck in 1903, a committee was appointed composed of Dr. F. R. Smyth, Dr. J. P. Aylen and Dr. W. H. Bodenstab, to revise the Constitution and By-Laws in conformity with the recommendations of the American Medical Association. This committee presented their report, and the new constitution and by-laws were adopted at the Annual Meeting at Fargo, May 25-26, 1904, the name being changed to the North Dakota State Medical Association.

At the Annual Meeting of the association in 1918, another revised edition of the constitution and by-laws was authorized and a committee consisting of Dr. Geo. Williamson, Dr. A. J. McCannel, and Dr. G. J. McIntosh was appointed to draft the same. The report of this committee was presented and adopted at the Annual Meeting of the Association at Grand Forks, June 23, 1919.

The early meetings of the State Medical Society were well attended and had exceedingly interesting and varied programs. At the Larimore meeting in 1889, which was practically the first general meeting of the Society, the others being merely preliminary, we find the following program:

The Medical Association of North Dakota	Dr. J. G. Millspaugh
Choice and Preparation of Food	Dr. John Montgomery
Early Detection of Astigmatism	Dr. John E. Engstad
Empyema	Dr. C. D. Conkey
Fracture of the Superior Maxilla	Dr. F. G. Lundy
Tonic Spasm	Dr. F. G. Lundy

The following extract from the President's address at this meeting is worth recording:

"There are about one hundred graduates practicing medicine in North Dakota, certainly enough to form a strong medical society if they will all take an interest in it. We need not hesitate on account of numbers. I think, moreover, that I am justified in saying that the medical profession of North Dakota will compare favorably in point of general professional respectability with the medical profession in any other part of the world. The great majority of our members are graduates of the leading medical schools of this and other countries and are men of broad culture and superior intelligence. I, at least, know of no other place in the United States where there are so few quacks and representatives of the various medical isms and pathics. But as the country grows older and more wealthy, these parasites are sure to come. They will secure a following and their presence will here, as elsewhere, always be detrimental to the interest of science and the welfare of the profession."

The program of the next annual meeing at Jamestown, 1890, was a "humdinger." Drs. John F. Fulton, Arthur Sweeney, and Eugene Riggs, of St. Paul, were present and duly elected as honorary members of the Society.

President's Address	Dr. J. G. Millspaugh
Progressive Medicine	Dr. John F. Fulton
Practical Points for the Country Surgeon	Dr. Henry W. Coe
The Status of Feeble Minded and Imbecile Children of North Dakota	Dr. O. W. Archibald
Paranoia	Dr. Eugene Riggs
The Country Midwife	Dr. Geo. McIntyre
Puerperal Septicemia	Dr. H. M. Wheeler
A Laparotomy	Dr. J. Grassick
Fracture of the Skull	Dr. Merchant
The New Hypnotics	Dr. D. S. Moore
Mastoid Disease	Dr. Logan

In a group of people like the North Dakota Medical Association, whose ideals are of the highest, and whose aim is to elevate the profession of medicine to the topmost round of ethical and scientific standards, there is no room for mercenary charlatans, get-rich-quick promoters, or self-seeking adventurers, and far less in its highest elective position, for other than those who won their spurs in their chosen profession, and who have demonstrated to their fellows that they are worthy of the honor.

That the office of President of the State Medical Association has been filled by its several occupants with an eye single to the welfare of organized medicine in our State is attested by its standing, its progress, and its achievements.

Our Association has been extremely fortunate in its presidents. With scarcely an exception, they have been not only of the highest standing in their profession, but men who would have graced any position of trust or responsibility to which they might have aspired. We can truthfully say and we do so with some pride, "We have been captained well."

Dr. J. G. Millspaugh, "Father of organized medicine in North Dakota," was born February 19, 1851, at Battle Creek, Michigan. In the fall of 1874 he entered the medical department of the University of Michigan

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*Excerpts are hereby presented from *North Dakota Medicine Sketches and Abstracts*, by J. Grassick, M.D., published by the North Dakota Medical Association, 1926. Dr. Grassick, now deceased, was president of the Association in 1923.

and graduated in June, 1876. While at Ann Arbor he was a student of Prof. Henry S. Cheever, lived at his home, and assisted him in the lecture room, and incidentally was the recipient of many valuable favors. To have had the privilege of associating intimately with a man of his standing and character and imbibing his enthusiasm and love of work was an experience well worth while. Through his advice he matriculated in the fall of 1876 at Columbia, College of Physicians and Surgeons, and graduated from that institution in 1877. He came back to his home town, opened an office and practiced there until the spring of 1882.

Finding his health failing, Dr. Millspaugh in 1882 decided to go to Dakota, then opening for settlement, and farm for awhile. He bought a farm near the then town of Garfield, Walsh County. He built a house, lived out of doors, and soon got well. When the Great Northern Railway was extended from Larimore to the Park River in 1884 a new town started up and Garfield moved over to the new town site, and Dr. Millspaugh moved with it. Here he remained and practiced until 1891 when he moved to Little Falls, Minnesota.

What has made his name in the annals of North Dakota Medical History secure is the active part he took in organizing the profession of the state. To him more than any other person we are indebted for the North Dakota Medical Association which was organized at Larimore in 1887. As an evidence of the esteem in which he was held by his fellows and of the confidence that was reposed in him, he was elected as its president for three consecutive terms.

We may regard it as highly fortunate that we have the first formal address given by the first president of our Association at its first annual meeting in the newly created state of North Dakota.*

The address is in part as follows:

Fellow Members of the North Dakota Medical Society:

Deference to a time-honored custom is my apology for a few remarks on this occasion.

My first sentiment is one of gratitude to the members of this Society for the high honor of being named to preside over your deliberations. Allow me to express my appreciation of your action and to indulge the hope that the confidence thereby implied has not been entirely misplaced.

This society germinated a few years ago, during the territorial regime, by a fortuitous concourse of medical atoms, or if you please, in accordance with the evolution hypothesis, in response to a genuine want, a desire for professional association on the part of a number of medical gentlemen in North Dakota. It was felt that no county or mere local society, except in two or three instances, could supply this want.

It is of course too early in our career to indulge in a retrospect or offer a prediction, but I must venture to observe that when we view our present condition and take into consideration the many obstacles incident to our situation, and compare it with the throes attending the birth of similar organizations in the other states, it seems to me that we have reason to conclude that both mother and child are doing well. The attendance and interest in this meeting are gratifying indications of a zeal and determination on the part of the profession to sustain this organization. It seems to me that we are emerging from the woods, from the crucial period in our history; that the omens are favorable; that the work so far accomplished, though small may be pronounced good.

This society, the profession, and people of the state, and especially those gentlemen of the profession who were members of our recent legislature, are to be congratulated that our new state starts out upon its career with a law regulating the practice of medicine, equal, if not superior in tone and efficiency, to anything that has yet been enacted. In this connection, too, it gives me great pleasure to acknowledge the valuable assistance by Dr. Arthur Sweeney, Secretary of the Minnesota State Board of Medical Examiners, and Dr. John F. Fulton, of St. Paul, in the original draft of this instrument.

Our worthy Governor, in deference to our wishes and in keeping with his excellent judgment in other matters, has kindly consented to consider nominations from this society for the Board whose duty it will be to enforce the provisions of this law. This is as it should be. I hope and trust that our action in this particular will be broad-gauged and such as to demonstrate its wisdom, commending itself to our chief executive and thus establishing a valuable precedent.

Thanks to the ennobling tendency of our study and work, our profession has been blessed with the most illustrious examples of men with whom the personal element has been suppressed and whose lives were devoted to the upbuilding of their art. This moral development of our profession has always been a purely spontaneous one, and that, too, in the face of the fact that the economic or material interest of the individual has always seemed to be in the opposite direction.

It seems to me, on the other hand, that the crowding of the profession at the present day and the material struggle incident thereto necessitates a refinement of ethical conduct not demanded or dreamed of in earlier times. And so, too, in a new and sparsely settled, free-for-all country like this, where two or three, or at most a dozen medical men are perforce brought into professional contact and business association without any regard to congeniality or compatibility and having different views as to what may be proper and honorable conduct, it seems to be especially important that there should be some standard fixed by the profession which would serve as a guide in our more important relations.

Gross breaches of professional ethics among educated men are, I believe, becoming more and more uncommon. This is due, undoubtedly, to an improved educational standard, the more exact nature of our science and practice, the more rapid diffusion of knowledge through our periodic literature, bringing all nearer to the same level of intelligence, to a more just appreciation of the true office of the physician on the part of the laity, and especially to the emphasis that is placed upon this subject at the threshold of our career in the teaching of the schools.

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*The official records of the North Dakota Medical Association were destroyed by fire in 1911.

◀ AMERICAN STUDENT HEALTH ASSOCIATION ▶

Comparative Sensitivity to Histoplasmin and Tuberculin in Ohio University Students[*]

E. Herndon Hudson, M.D., Frank R. Moore, M.D., and Eileen A. Phillips, M.D.
Athens, Ohio

The relationship between histoplasmosis and tuberculosis, especially as regards their common property of producing calcifications in the lungs, is attracting the attention of growing numbers of investigators and clinicians. Although the situation cannot yet be stated in detail, enough has been learned to justify the prediction that basic concepts in regard to tuberculosis will need to be radically revised.

HISTORICAL REVIEW

Histoplasmosis at its discovery gave no promise of its later significance. When Darling[1] first described the parasite which he named *Histoplasma capsulatum* in 1906, he thought he was dealing with a protozoan, and he likened it to *Leishmania donovani*. In the titles of his second and third papers in 1908 and 1909 he called histoplasmosis a fatal disease of tropical America. No further cases appeared in the literature until 1926 when one was reported from Minnesota, followed later by one from Honduras and two more from the United States. Then in 1939 Humphrey[2] reported five cases, all fatal, from Michigan; he not only suggested that the appellation "tropical" was a misnomer, but hazarded the thought that the increasing number of reported cases represented an increase in the prevalence of the disease.

In 1940 Meleney[3] reviewed 32 cases which had been reported or had been brought to his attention, and took the view that though the disease might be increasing in prevalence, it was probable that many cases had been overlooked in the past, and he predicted that "a considerable incidence of the disease (would) be shown to exist not only in the Western Hemisphere but throughout the world." Meleney mentioned the analogy to Leishmaniasis, but cited the work of DeMonbreun who in 1934 had cultured the organism from a human case and had demonstrated that it was a fungus exhibiting both yeast-like and mycelial forms.

Conant[4] in the following year (1941) cultured the organism from the fatal case of a 3-month-old infant and concluded that Histoplasma was a distinct genus in the Moniliaceae of the Fungi Imperfecti, "characterized by a saprophytic filamentous form of loose, cottony, white to light-brown mycelium, producing small and large, single-celled, smooth to tuberculate chlamydospores in culture at room temperature, and small budding, yeast-like cells on blood agar at 37° C; and by a parasitic yeast-like form causing a fatal systemic infection in man and dog in whose infected tissue the fungus occurs as yeast-like, oval bodies phagocytized by endothelial leucocytes."

The first reference to a skin test came in 1941 when Van Pernis[5] and his co-workers reported on "specific cutaneous reactions with histoplasmosis." The same investigators[6] later reported their case more fully, and again described the skin reactions to a prepared antigen. They were impressed with similarity between histoplasmosis and tuberculosis, not only in clinical symptoms but also in gross and microscopic pathological changes. They found the invasion of the parasite not limited to the reticulo-endothelial system but extending to cells of epithelial origin as well.

In spite of the fact that this new diagnostic weapon was being developed the only cases that were reported continued to be of the fatal type. Van Pernis said "only fatal infections thus far have been recorded." Broders,[7] et al., in the same year (1943) reported the first case of vegetative endocarditis and referred to the 37 cases collected by Hild the year before, of whom 7 were infants under 15 months of age. Broders also said, "To date the disease has been universally fatal." Beamer[8] in 1944 reported "the 50th recorded case of histoplasmosis in human beings, the tenth to occur in an infant less than 15 months of age." He also noted the difficulties of the diagnosis and stated that it had been made during life in less than 12 cases.

Up to this point histoplasmosis therefore remained a rare and fatal disease which had scarcely lost its exotic reptuation. In fact, a prominent Ohio politician who died of histoplasmosis in 1946 was said by the press to have succumbed to a "rare blood disease." Only in very limited circles had the suspicion arisen that histoplasmosis might actually be a very widely distributed disease, in large part entirely benign, and hitherto recognized only in its extremely rare fatal form. This suspicion was based upon two general observations, one that throughout a certain section of the Middle West there was more pulmonary calcification in non-reactors to tuberculin than in the country as a whole, and the other that pulmonary calcifications confusable with tuberculosis had been identified in California as due to infection with another fungus, *Coccidioides immitis.*

In regard to the first point, Christie and Peterson[9] in an important paper in 1945 called attention to one of the unsolved clinical problems in tuberculosis control—"the question of calcification in the chests of persons who do not react to tuberculin." As they said, it had been generally assumed that only exceptionally would a person who had been previously infected with tuberculosis fail to react to proper dilutions of tuberculin or P.P.D. But though this might be true for large sections of the country, they said, various regions approximated this truth in varying degrees, if pulmonary calcification were accepted as presumptive evidence of prior tuberculous infection. They collected numerous examples from the literature showing that in a certain area in the Middle West there was an inordinate amount of pulmonary calcification unmatched by corresponding amount of skin sensitivity to tuberculin.

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[*] From the Student Health Service, Ohio University, Athens, Ohio.

Presented by Dr. Moore at Ohio State Student Health Association meeting, Cleveland, April 11, 1947.

For example, in 1933 in Tennessee, 17 per cent of a group not reacting to tuberculin had pulmonary calcifications, and in 1938 in the same state, while 44.5 per cent or more than a thousand white children reacted to Old Tuberculin, 48.1 per cent of the non-reactors had pulmonary calcifications. They cited Gass and his co-workers in Tennessee who examined 573 persons in 1937-39, among whom 373 had pulmonary calcifications; there was no apparent correlation between pulmonary calcifications and tuberculin skin reactions. In 1941 Olsen and co-workers in Ohio examined 485 children of whom 129 (26.6 per cent) had pulmonary calcifications. Of 148 children who were X-rayed and skin-tested, 62 had pulmonary calcifications, but only 9.7 per cent of these 62 children reacted to tuberculin. Christie and Peterson again cited Gass who in 1943 reported a large series of school children in Tennessee. Eighty-three per cent of white children and 72 per cent of colored children had pulmonary calcifications, generally acquired at an early age, and many of those who acquired calcifications in the course of the study remained non-reactors to tuberculin.

They also cited Long and Stearnes[10] who in 1943, reporting on a large series of Selective Service induction X-rays, found a "prevalence of pulmonary calcification far beyond what can be explained on the basis of tuberculosis as revealed by tuberculin testing." They found excessive calcification in induction X-rays in a geographical area comprising the eastern slope of the Mississippi River basin and the adjacent states of the western slope south of Iowa. Within this area the pulmonary calcifications were not only more frequent, but larger and more extensive, and there were more cases of disseminated miliary calcification. Calcifications were recorded in induction X-rays in 23 per cent of inductees in Missouri, 28 per cent in Kentucky, and, for contrast, in only 6 per cent in Washington State.

As Christie and Peterson pointed out, two hitherto accepted assumptions were proving to be incompatible. Which would have to be revised? Either tuberculin sensitivity is not a stable phenomenon, or pulmonary calcifications may be due to some infection other than tuberculosis. What other etiologic agent could be mimicking healed tuberculous pulmonary calcifications?

In one of those coincidences which research sometimes provides, a possible answer was at hand. For in the meantime, in California, Smith and his associates had been studying coccidioidomycosis, and in 1943[11] wrote that it is generally recognized in endemic areas that infection with *C. immitis* "produces a primary complex which goes on to calcification indistinguishable from that of tuberculosis." *C. immitis* was known not to occur east of the Rockies but it might furnish a clue. In December 1943 Smith wrote personally to the Nashville workers to say, ". . . it seems very likely to me that infection (probably fungus) causes a similar situation (pulmonary calcifications) in Tennessee . . . This is the area of pulmonary calcifications in tuberculin-negative persons and is also the endemic area of histoplasmosis." Thus was established the second point supporting the suspicion that a fungus infection, perhaps histoplasmosis, might underlie a certain proportion of pulmonary calcifications.

In January 1944 Christie and Peterson[9] began to test the skin reactions of children with the antigen histoplasmin. Among 181 children of whom 79 (43.6 per cent) had pulmonary calcifications they found that 45 (24.9 per cent) reacted to tuberculin and 133 (73.5 per cent) reacted to histoplasmin. Thus histoplasmin reactors numbered three times tuberculin reactors, and pulmonary calcifications were almost double the number of tuberculin reactors. They found (1) that pulmonary calcification and sensitivity to histoplasmin were associated early in life, and earlier than calcification and a positive Mantoux; (2) that the respective ages of onset of histoplasmin sensitivity and appearance of calcifications pointed to a cause-and-effect relationship, which was not true of tuberculin sensitivity.

These two investigators suggested therefore that the accepted interpretation that pulmonary calcification was usually or generally evidence of primary or first infection type of tuberculosis might need to be completely re-evaluated, particularly for a large central region of the United States. They also suggested that the uniformly fatal character of histoplasmosis as formerly reported did not necessarily preclude the possibility of benign forms occurring, or even being common. They recognized, however, that the etiological relationship between histoplasmosis and sensitivity to histoplasmin had not yet been established.

As soon as histoplasmin skin reactions began to be reported the question was raised as to their specificity. Emmons et al.[12] published in 1945 a caution against too literal interpretation of fungus antigens, in view of their notorious tendency to cross-reactions. These investigators thought histoplasmin had faults which seriously limited its usefulness as diagnostic material. McLeod et al.[13] in March of 1946 took a similar position. They said the clinical diagnosis of histoplasmosis was relatively impossible, and histoplasmin not a suitable diagnostic agent. "The diagnosis of histoplasmosis can be established only by the laboratory demonstration of the fungus," they said.

Palmer,[14] however, in the following month (April, 1946) by-passed the question of specificity. Leaving judgment on that issue suspended for the moment, he charted the geographic distribution of sensitivity to histoplasmin in a large number of student nurses. Dividing the United States into ten regions, he showed that region I, comprising Tennessee, Kentucky, Arkansas, Missouri, Indiana, and parts of Ohio, Illinois, Kansas, and Louisiana, had a percentage of reactivity to histoplasmin of 68.3; whereas region X, stretching from Washington and Oregon to western Michigan, and from Colorado to the Canadian border, had a percentage of reactivity to histoplasmin of only 1.4. Ohio taken as a whole had a percentage of 60.2.

Since, in a paper published the previous year (1945), Palmer [15] had shown that there was a high correlation between skin reaction to histoplasmin and calcification in the lungs, he felt justified in concluding that the histoplasmin reaction had medical significance and represented some previous experience, presumably infectious, which stood to the pulmonary calcifications in the position of cause to effect.

In August of 1946, Furcolow [16] and his associates carried the investigation forward with a report on a survey begun the year before in Kansas City, Missouri. They subjected 17,000 children and 1200 adults to the triple test of tuberculin, histoplasmin and X-ray. They found histoplasmin reactions commoner in white than in colored persons, and in males more so than females. They were also more common among those who were *not* lifetime residents of the area than among those who were. Tuberculin reactions, on the other hand, were three times more common among negroes than among whites and were not related to sex or residence. Pulmonary calcifications were twice as common among histoplasmin reactors as among tuberculin reactors, and pulmonary calcification without either skin reaction was low (2.6 per cent). In both histoplasmin and tuberculin reactors there was marked increase of incidence with age, but the correlation began earlier in life in the case of the histoplasmin reactors.

In June and October of 1946 Christie and Peterson[17,18] published further studies on children and young adults in Tennessee. They demonstrated a direct relation between the development of histoplasmin sensitivity and pulmonary calcifications, while tuberculin sensitivity lagged behind. They also found few (7.6 per cent) instances of pulmonary calcifications without skin reaction to one or both antigens. Their maps showed close correlation between histoplasmin reactions and the distribution of pulmonary calcifications in Tennessee, and among college students vis-à-vis their original residence in the United States. The results of their tests with other fungus antigens gave definite support to the concept that a skin reaction to histoplasmin was indicative of the presence of histoplasmosis.

Christie and Peterson mentioned four groups of concepts which probably require revision in the light of present knowledge concerning histoplasmosis. These concern the significance of pulmonary calcification in relation to (1) the primary tuberculous complex, (2) the reinfection type of tuberculosis, (3) the question of fitness for military service, and (4) the value of mass chest X-rays. They emphasize that these matters concern clinicians, public health officers, roentgenologists and pathologists alike.

The assumption that there is a widespread benign calcification-producing fungus infection, raises so many important questions that the collection of more data is imperative. Palmer's figures reveal an interesting distribution of skin sensitivity to histoplasmin in Ohio. He found the state-wide proportion of reactors to be 60.2 per cent, but there was wide variation within the state. In southwest Ohio the proportion of reactors was 86.4 per cent, in central and northern Ohio 63.9 per cent, and in an eastern zone only 28 per cent.

Since the figure for eastern Ohio was based upon a relatively small number of observations it seemed desirable to collect data on students at Ohio University, situated in southeastern Ohio. Although students are drawn here not only from all parts of this state but from many others as well, it could be assumed that results of a survey would roughly represent the young adult population of this corner of the state.

MATERIAL, METHODS AND RESULTS

Three groups of students have now been subjected to simultaneous examination by chest X-ray and by tuberculin and histoplasmin skin tests. No individual appears in more than one group. The data thus secured provide the basis for this report.

All X-rays were made on 35 mm. film by a commercial company* and were interpreted by one person (F. R. M.) with the aid of a magnifying viewer, and without knowledge of the tuberculin or histoplasmin reactions. The diagnostic quality of the films was satisfactory in all groups.

The tuberculin employed in the first two groups was Purified Protein Derivative† in a single dose of 0.00002 mg. in 0.1 cc. of diluent, the so-called first-strength dose. The tuberculin in the third group was Old Tuberculin in a single dose of 0.1 cc. (0.1 mg.). In both cases this quantity was delivered intracutaneously.

The histoplasmin employed was a 1/1000 dilution of a filtrate of broth culture of *Histoplasma capsulatum*, prepared by Dr. Arden Howell and furnished through the courtesy of Dr. Carroll E. Palmer and Dr. Michael L. Furcolow, all of the Tuberculosis Control Division of the U. S. Public Health Service. The May and September tests were made with the same sample of histoplasmin; the February tests were made with a sample furnished later. The histoplasmin was injected intracutaneously in a dosage of 0.1 cc. Each test was given with a different set of syringes.

Both skin tests were given by one of three persons, and were read after 48 hours by one person (E.A.P.). In both tests a reaction was considered positive if edema or induration of 5 or more millimeters in diameter was present.

Group I. In May 1946, after a short publicity campaign, a chest X-ray was offered to all students on the campus, and 2377 students accepted the opportunity.

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*National X-ray Surveys, Inc.

† Parke, Davis & Co., Detroit, Michigan.

These constituted 85 per cent of the 2797 students then enrolled. Four hundred twenty-five (17.7 per cent) of the X-rayed students showed pulmonary calcifications. Individual contacts were made with these 425 students and they were advised to have the skin tests. Three hundred fifty-nine of them followed this advice (four were not tested with histoplasmin). It will be noted first that this was a voluntary group, and second that the skin tests were only made on individuals with demonstrable pulmonary calcifications. The results are tabulated below.

Group II. In September 1946 the voluntary principle was abandoned and all Freshmen, numbering 2138, were required to have chest X-rays. Three hundred sixty-six (17.1 per cent) showed pulmonary calcifications, a percentage very closely approximating that of Group I. Three hundred eight of the 366 were skin-tested with results tabulated below. In this group, however, skin testing was not limited to those with pulmonary calcifications. Altogether, 1727 unselected Freshmen were tested with tuberculin and 1576 with histoplasmin. The results are tabulated later in this paper.

Group III. In February 1947, 356 students who were entering as Freshmen, or who were previously missed, were subjected to chest X-rays, and of these, 346 were given the skin tests. Of the 356 only 29 (8.1 per cent) showed pulmonary calcifications, less than half the incidence of the two larger groups X-rayed previously. The results of the skin tests are as follows:

In May, 12 per cent of 359 students with calcifications and in September, 20.1 per cent of 308 similar students reacted to tuberculin. Among Palmer's nurses, 21.4 per cent reacted to tuberculin.

Among 1727 unselected Freshmen in September, 9.3 per cent reacted to tuberculin; in a similar series of 346 students in February, 30.6 per cent reacted to tuberculin. This larger percentage may be partially due to a shift to Old Tuberculin.

Taking Group II and Group III together, we found 266 (160 and 106) tuberculin reactors among 2073 unselected students, or 12.8 per cent. While this incidence of tuberculin reactors is not inconsistent with percentages observed on other campuses, we felt that the number would have been greater if a larger dose of P.P.D. had been used in Group I. The incidence of reactors in 208 colleges representing over 300,000 students, as reported for 1942-43, was 18.6 per cent, according to Myers.[20] Palmer's figure of 21.4 per cent may not be quite comparable because obtained in nurses, who because of their occupation tend to have relatively more reactors.

Palmer [15] states that only 25 (8.5 per cent) of his 294 nurses with calcifications failed entirely to react either to tuberculin or histoplasmin. When doubtful readings were included, his figure was 33, or 11.2 per cent. Christie and Peterson [17] in 183 children with calcifications, found only 7.6 per cent failing to react to either antigen. In our Group I, 135 (37.6 per cent) students with calcifications failed to react to either tuber-

A. *Skin tests in individuals with pulmonary calcifications.* Figures from Groups I (May 1946) and II (September 1946) are given. For comparison, the figures which Palmer[15] secured in a group of 294 nurses, residents of widely scattered points in the United States, are given in a third column.

	Group I 359 Students	Group II 308 Students	Palmer 294 Nurses
1. Tuberculin positive and histoplasmin positive	19 (5.3%)	37 (12.0%)	35 (11.9%)
Histoplasmin doubtful or negative, or not tested (1)	24 (6.7%)	25 (8.1%)	28 (9.5%)
Subtotal tuberculin positive	43 (12.0%)	62 (20.1%)	63 (21.4%)
2. Tuberculin negative and histoplasmin positive	181 (50.4%)	161 (52.3%)	198 (67.4%)
Histoplasmin doubtful or negative, or not tested (3)	135 (37.6%)	85 (27.6%)	33 (11.2%)
Subtotal tuberculin negative	316 (88.0%)	246 (79.9%)	231 (78.6%)
3. Histoplasmin subtotals	(355 tested)		
Positive	200 (56.3%)	198 (64.3%)	233 (79.3%)
Negative	155 (43.7%)	110 (35.7%)	61 (20.7%)

B. *Skin tests in unselected series.* Figures are given for Groups II (September 1946) and III (February 1947).

	Group II 1727 Students		Group III 346 Students
1. Tuberculin positive and histoplasmin positive	59 (3.4%)		15 (4.3%)
Histoplasmin negative or not tested (13)	101 (5.9%)	(all tested)	91 (26.3%)
Subtotal tuberculin positive	160 (9.3%)		106 (30.6%)
2. Tuberculin negative and histoplasmin positive	588 (34.0%)		37 (10.7%)
Histoplasmin negative or not tested (138)	979 (56.7%)	(all tested)	203 (58.7%)
Subtotal tuberculin negative	1567 (90.7%)		240 (69.4%)
3. Histoplasmin subtotals	(1576 tested)		
Positive	647 (41.0%)		52 (15.0%)
Negative	929 (59.0%)		294 (85.0%)

culin or histoplasmin (three were not tested with histoplasmin). In our Group II, 85 (27.6 per cent) students with calcifications failed to react to either skin test. Our percentages are therefore from three to five times those of others, and are probably too high. This probably means that, relatively speaking, we were under-reading our positives; or perhaps the difference was due to the use of a smaller dose of tuberculin.

In regard to histoplasmin, 398 (200 and 198 in Groups I and II) students with calcifications reacted to histoplasmin, or 60.0 per cent of 663 students. This is less than Palmer's percentage of 79.3 per cent.

In our unselected series of Freshmen, 699 (647 and 52 in Groups II and III) students reacted to histoplasmin, or 36.4 per cent of 1922 students. This is to be compared with Palmer's [15] of 28 per cent for the eastern area of Ohio.

In general, Group III (February 1947) did not furnish results consistent with those of May and September. In fact, they were not consistent with themselves, for although the pulmonary calcifications were proportionately less than half those of September, the reactors to tuberculin were more than three times more frequent. The use of Old Tuberculin in place of P.P.D. hardly seems sufficient to explain this paradox. It must be noted also that whereas 41.0 per cent of the September group reacted to histoplasmin, only 15.0 per cent in February so reacted. This may be related to the use of a different sample of histoplasmin. There was no apparent difference in the two groups of students, but perhaps the February group was not large enough to constitute a fair sample.

In regard to correlation of pulmonary calcifications and skin reactions, we found that among the students with calcifications in Groups I and II, these pulmonary signs were associated with a skin reaction to histoplasmin in 60.0 per cent, and with a tuberculin reaction in only 15.7 per cent. Furcolow,[16] in a group of over six thousand children in Kansas City, Missouri, found 12.7 per cent showing definite or probable pulmonary calcification; and the frequency of calcification was over twice as high among reactors to histoplasmin alone as to tuberculin alone.

COMMENT

According to Zwerling and Palmer [19] in 1947, cases are accumulating in which the clinical relation of skin sensitivity to histoplasmin and objective X-ray signs are being correlated over periods of considerable time. Were it not for recent knowledge these cases would doubtless have been called tuberculosis. As Smith said in discussing their paper ". . . it would appear that the noose is tightening around *Histoplasma capsulatum*."

In this article, designed especially for the attention of physicians concerned with the health of college and university students, two comments are particularly appropriate. In the first place, there seems to be a widespread and apparently benign infection of fungus nature, presumably histoplasmosis, which produces pulmonary calcifications which cannot be distinguished by present criteria from those produced by tuberculosis. This infection seems to be especially prevalent in certain central states adjacent to the junction of the Ohio and Mississippi rivers. This infection, in itself, has no apparent clinical significance except in rare instances.

In the second place, though the etiology and epidemiology of this infection is still obscure, it can apparently be identified by the histoplasmin skin test.

This means that programs designed to reveal the individual and group status of students in respect to tuberculosis on all campuses, and particularly in the area indicated above, are no longer complete unless they include the histoplasmin as well as the tuberculin skin test. Otherwise subsequent X-rays will reveal calcifications which may be wrongly imputed to tuberculosis, as it now seems was done in X-ray examinations of selective service inductees. Myers [20] states that it seems not more than one-fifth to one-fourth of the persons rejected for military service because of tuberculosis actually had this disease in significant clinical form.

Those campus programs which, contrary to accepted opinion, still rely wholly upon mass chest X-rays are in a particularly vulnerable position. They should use both skin tests in a follow-up of cases showing pulmonary calcifications.

In the wider clinical field it appears that, particularly in the geographic area in which histoplasmin reactors occur in large proportions, it is obviously not good practice for a roentgenologist to "diagnose" pulmonary tuberculosis, whether primary or secondary, active or arrested, without supporting evidence in regard to both the tuberculin and histoplasmin skin reactions. As Zwerling and Palmer state, it is not possible with present knowledge to distinguish between pulmonary calcifications due to the tubercle bacillus and those due to fungus infection (presumably histoplasmosis). "The calcified primary complex, massive hilar calcification and other types may fall in either group."

Though regret that a new element of confusion has been introduced into the clinical and roentgenological identification of tuberculosis may be the first reaction, afterthoughts are more comforting. For in many cases of pulmonary calcification these signs can now properly be attributed to a benign fungus infection, precautions can be relaxed and anxieties relieved.

What bearing has histoplasmosis on the utility of mass surveys of the adult population, particularly in military, educational and industrial groups? There is nothing in the new situation which would modify in the least the value of such surveys. It will be necessary, however, to carry the investigation one step further. The group of individuals with pulmonary calcifications will have to be broken down further on the basis of their skin sensitivities. In a wide area of the United States a large proportion of the group can by this means be excluded from further consideration, and this substantial reduction in the group for which precautions are justified will amply compensate for the additional investigation.

In conclusion, the net result is fresh evidence that prime reliance upon the tuberculin skin test in diagnosis is justified, and that information gained through this test is unobtainable by any other means. As Myers[20] says, the tuberculin skin test is one of only two specific tests in this disease, the other being the presence of tubercle bacilli. However, the concept of a fungus infection tested with histoplasmin offers an explanation for many puzzling cases of pulmonary calcification accompanied by failure to react to tuberculin.

Summary

1. The historical development of current concepts concerning histoplasmosis and the histoplasmin skin test, and their relation to tuberculosis and pulmonary calcifications, are reviewed.

2. Several thousand university students in southeastern Ohio were recently subjected to the triple test of chest X-ray and sensitivity to tuberculin and histoplasmin.

3. Three groups numbering 2377, 2138 and 356 were X-rayed. Pulmonary calcifications were found in 17.7 per cent, 17.1 per cent and 8.1 per cent respectively, in these groups.

4. In 667 students with pulmonary calcifications, 105 (15.7 per cent) reacted to tuberculin. In 663 of these students, 398 (60.0 per cent) reacted to histoplasmin. Thus these pulmonary signs were associated with a histoplasmin reaction about four times as often as with a tuberculin reaction. Balanced against this comparison is the fact that about a third of students with calcifications failed to react to either skin test, and our feeling that this indicates that our methods failed to reveal as many tuberculin reactors as they should have.

5. In 2073 unselected Freshmen, 266 (12.8 per cent) reacted to tuberculin. In a similar group numbering 1922, 699 (36.4 per cent) reacted to histoplasmin. Thus histoplasmin reactions occurred in the general student population about three times as frequently as tuberculin reactions.

6. Tuberculosis case-finding programs on college campuses are no longer complete unless they include the histoplasmin skin test. This is also true of mass X-ray surveys of military and industrial groups, and will be true so long as it remains impossible to distinguish between the roentgenological signs of tuberculosis and histoplasmosis.

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The 1948 edition of "Facts and Figures about Infantile Paralysis," a publication of the National Foundation for Infantile Paralysis, is now available to physicians and public health workers. Statistics on the disease, revised yearly, are gathered from the United States Public Health Service, state health departments and various other sources.

Incidence of infantile paralysis in the United States is shown in tables, maps and charts. Other statistics furnish information on age and sex distribution, case rates, crippling conditions and mortality. For the first time, this publication includes data on the disease in foreign countries.

Copies of the booklet (No. 59) may be secured free of charge by writing Education Service, The National Foundation for Infantile Paralysis, 120 Broadway, New York 5, N. Y.

College Students and Health Education*

Alexander G. Ruthven †
Ann Arbor, Michigan

May I begin my remarks with a quotation: "The breaking down of the health of the students, especially in the spring of the year, which is exceedingly common, involving the necessity of leaving college in many instances and crippling the energies and destroying the prospects of not a few who remain, is in my opinion wholly unnecessary if proper measures could be taken to prevent it." At least most of us know that this comment made by President Stearns in 1856 did not refer to spring fever—that seasonable disease which turns young people's fancies and often interferes seriously with digestion and college grades. It was more likely inspired by the quaint but interesting book by Edward Hitchcock, "Dyspepsia Forestalled and Resisted."

The development of student-health services in this country since the excellent beginnings made at Amherst College has been truly remarkable. Especially is this true when one takes into consideration the difficulties which have had to be overcome, and which I do not need to enumerate. But, great as have been the achievements of the student-health units in our colleges, there is still room for improvement. For example, it is most regrettable that a number of institutions, including some of the larger ones, have not as yet developed departments in this field. For this failure, college administrators and physicians must share the blame. The former clearly, in some instances, have lacked the courage to resist obstructionist activities of doctors who are opposed to anything which resembles socialized medicine. At the same time, there are medical men in college communities who may rightly be criticized for their unwillingness to subordinate their own interests to the greater good, or, at the very least, for their inability to see that generally speaking, student groups are after all an unimportant financial asset to the practitioner. There is need here for more missionary work, looking toward the conversion of both college executives and doctors.

But deplorable as is this situation, in another and more general way our schools have been derelict in meeting their responsibilities for the health of the young men and women who come to them for instruction. I refer to the failure of the colleges to develop sound programs of health education. It is curious that the student-health service up to this time has been concerned almost exclusively with providing medical care in the restricted meaning of the term. Voluntarily or perforce they have neglected teaching and thereby provided the pound of cure, but not even a full ounce of prevention. One doctor has said: "We have failed to get for health education a seat even at the foot of the table of respectable subjects in the college curriculum."

Many of us who have responsibility for the physical welfare of students agree that health is one of the cardinal principles of education. We note the great benefits that have come to men as the result of the application of science to the prevention of disease and the reduction of deaths, the prolongation of life, the increase of stature in young people, and the material savings to society. We can almost agree that such advantages cannot be equalled by the results of any other form of public endeavor. But, with all the information before us, we still continue to ignore the importance of the individual personal approach to the subject of good health in the young and formative years. If technical, scientific, personal health education is important, then it is clearly the business of educational institutions to do something worth while about it.

This conclusion is not new. In fact, a second objective stated for the inauguration of the department of physical education and hygiene at Amherst College in 1859 has to do with the relating of education to health. Few will deny, however, that attention to student illness and to the correction of physical defects has continued to be stressed much more generally than has health instruction. In fact, it may be asserted, with little danger of successful contradiction, that the colleges, like the grade schools, have lost many years of opportunity in the development of their health programs by neglecting health teaching, and the responsibility for this loss in time and opportunity must be accepted in full by college administrators and faculties.

As of about ten years ago, approximately one third of our institutions were reported to require courses in hygiene. A few colleges have required such courses for many years. It is safe to say, however, that much of the instruction has not gained respect and support because it has not been given its proper place in the curriculum. The consequences are obvious. Treatment of the subject has often been unscientific, unimportant, and based upon empirical traditions or has consisted merely of opinions of uninformed and overburdened instructors, and generations of our young people have left college as ignorant of their biological characteristics as when they entered. Practically all that some students learn about guarding their health they glean from such advertisements as "Don't let your vitamin pills get down to seven or you may find yourself in heaven."

I submit as a basic and enduring reality of life that knowledge of present, accepted, scientific facts is a determining factor in the protection and promotion of health and should be made a part of the equipment of every student. In other words, with all due appreciation of the value of clinical services, we should insist that equal attention be given by our health-service units, and

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*Presidential address delivered at the Third National Conference on Health in Colleges, New York, May 7-10, 1947. Reprinted with permission from *School and Society,* September 27, 1947. (Extra copies of this address may be obtained from the Secretary of the American Student Health Association.)

†President, University of Michigan, Ann Arbor.

the colleges and universities of which they are a part, to the teaching of health principles. We should put our students in the way of adding to their cultural and professional training the knowledge which will aid them to keep well both during their school life and beyond.

It would not be fitting for a college president and layman to attempt to draft a curriculum in this field. At the same time, common sense would indicate that in general terms such a curriculum should include basic courses in personal and community health, family health and mental health, and special courses on the health problems of specific occupations for which students are preparing themselves.

Inevitably, any attempt to add courses to the already overcrowded curricula of our colleges will meet with objections. The answer, however, is simple to give if not to apply. Since we cannot hope to give our students all of the knowledge they will need for the rest of their lives, relative values should be considered, and some of the less important offerings should be sacrificed for more adequate instruction in the art of keeping well. In the battle of the curriculum this is an important and long overdue engagement.

One of the excuses given for the neglect of health education is the difficulty in obtaining adequate personnel. As most college administrators and the directors of student health services will testify, it is not easy to attract and retain well qualified physicians for the health programs as generally set up in our colleges. The modest salaries, the routine, and the lack of opportunity for specialization and research, and, I would add, teaching do not offer inducement in these days to draw men and women from lucrative private practices. Nor, except possibly in small institutions, is the part-time service of physicians a satisfactory method of caring for student ills. In my opinion, the problem of securing adequate professional personnel could be simplified by recognizing that in our health program we need more than clinical service from our doctors. Specifically, I believe if the opportunity to participate in a sound program of health instruction were added to the privilege of practice, there would be adequate reasons and inducements for doctors to recognize student-health work as an important area in clinical and preventive medicine and as a promising career.

Several departments within the college structure have opportunities and responsibilities for the health of students. Foremost among these are student-health services, departments concerned with health instruction, and departments of physical education. Less directly but also importantly involved in this work are college agencies which promote sanitation of the environment and the student-guidance services. Only by a complete integration of these various units and only through their cordial co-operation can we hope to attain the maximum benefits in promoting health in our colleges.

American Student Health Association

News

Dr. Max Durfee, Director of Student Health at Miami University, Oxford, Ohio, is setting up a part-time psychiatric consulting service in cooperation with the College of Medicine of the University of Cincinnati.

The University of Cincinnati is offering three institutes: General Health Education, June 21-26; Social Hygiene, June 28-July 3; Mental Hygiene, July 5-10.

The Faculty includes: Dr. Helen Coops, Health Coordinator; Dr. Paul Poponoe, Director, Institute of Family Relations; Dr. Maurice Levine, Professor of Psychiatry, College of Medicine, University of Cincinnati; Dr. Robert Buckley, Coordinator, Mental Hygiene Institute.

For further information, write Dr. Spencer Shank, Dean, Summer School, University of Cincinnati, Cincinnati 21, Ohio.

Dr. Jane N. Baldwin, for many years Director of the Student Health Service at Vassar College, writes that she has been promoted to the status of emeritus, but is still active in her professional work. Dr. Acsha Bean has taken over the administrative direction of the Health Service.

PROGRAM
TWENTY-SIXTH ANNUAL MEETING THE AMERICAN STUDENT HEALTH ASSOCIATION

Thursday, Friday, Saturday, May 6, 7, 8, 1948
Hotel Statler, Detroit, Michigan
Host: Wayne University, Student Health Service
Irvin W. Sander, M.D., Director

PRELIMINARIES

Thursday, May 6

12:30 P.M.—Tour to Greenfield Village leaves Hotel Statler; returns about 5:30 P.M.

2:00—Open House at the Health Service, University of Michigan, Warren Forsythe, M.D., Host.

6:30—Meeting of Council, Hotel Statler.

Services Available

Information Desk.
Headquarters apartment.
Secretarial services, if requested in advance.

REGULAR SESSIONS

Friday, May 7

Session I—(Morning Session)

9:30 A.M.—(A) Registration

10:00—Call to Order.
Secretary's Report—George T. Blydenburgh, M.D.
President's Address—Harry D. Lees, M.D.
Appointment of Nominating Committee.

10:30—(B) Committee Reports
Local Sections Committee—E. Lee Shrader, M.D., Chairman
Research Committee—Ramona L. Todd, M.D., Chairman

11:00—(C) Committee on Tuberculosis—Max L. Durfee, M.D., Chairman
Present Concepts of the Use of Streptomycin in the Treatment of Tuberculosis—J. Rowland Reid, M.D., University of Michigan Medical School

11:50—(D) Committee on Health Instruction
Trends in Health Education—A. O. DeWeese, M.D., Chairman
Discussion—Dean F. Smiley, M.D., Bureau of Education, American Medical Association
Session ends at 12:20 P.M.

Association Luncheon—12:30 P.M. Speaker: David D. Henry, Ph.D., President, Wayne University, Detroit, Michigan

Session II—(Afternoon Session)

2:00 P.M.—(A) Committee on Health and Physical Activities, Irvin W. Sander, M.D., Chairman
Anti-Histamine Therapy—Sidney Friedlander, M.D., Wayne University College of Medicine
Discussion: Donald W. Cowan, M.D., University of Minnesota

2:40—Metabolism of Adolescence—Joseph A. Johnston, M.D., Pediatrician-in-Chief, The Henry Ford Hospital, Detroit, Michigan

3:10—Common Neurologic Problems of College Students—Robert B. Clarke, M.D., Theophile Raphile, M.D., Martha R. Westerberg, M.D., University of Michigan Medical School

3:40—(B) Committee on Environmental Hygiene, L. W. Holden, M.D., Chairman
Housing Standards—Howard J. Stroud, Sanitarian, Student Health Service, University of Michigan
Supervision of Dining Halls — Robert F. Willson, D.V.M., Director of the Bureau of Food Inspection for the Detroit Department of Health
Communicable Disease Control — Phillip Kermann, M.D., Health Officer, University Hospital and Physician, Student Health Service, University of Minnesota
Session ends at 4:25 P.M.

5:00 P.M.—*Wayne University Reception and Tea* for members and guests of the American Student Health Association. For directions, inquire at the Information Desk

Evening—No regular session. Group meetings, privately arranged

Saturday, May 8

Session III—(Morning Session)

9:30 A.M.—(A) Business Meeting
Report of Council Meeting
Report of Nominating Committee

9:50—(B) Committee on Mental Hygiene, Robert G. Hinckley, M.D., Chairman
Psychotherapy in a College Health Center—Dana Farnsworth, M.D., Massachusetts Institute of Technology
Discussion—Robert G. Hinckley, M.D.

10:25—(C) Committee on Health and Physical Activities, Irvin W. Sander, M.D., Chairman
The Management of the Common Types of Injuries Encountered in Student Health Practice—Thomas A. Martin, M.D., St. Louis University, St. Louis, Missouri

10:55—Management of Acute Eruptions of the Skin—Donald M. Pillsbury, M.D., Professor of Dermatology, University of Pennsylvania School of Medicine

11:35—Influenza Vaccine—E. Lee Shrader, M.D., St. Louis University; William G. Beadenkopf, M.D., Assistant Director, Student Health Service, University of Chicago
Session ends at 12:15 P.M.

Council Luncheon—12:30 P.M. This meeting of Council includes newly elected members.

College Nurses' Luncheon, Time and Place to be arranged.

Session IV—(Afternoon Session)

2:00 P.M.—(A) Committee Reports
1. Eye Health Committee, R. W. Bradshaw, M.D., Chairman
2. Ear Health Committee, J. W. Armstrong, M.D., Chairman
3. Veterans Affairs Committee, Ruth E. Boynton, M.D., Chairman
4. College Nursing Committee—N.O.P.H.N., Raidie Poole, R.N., Chairman; Miss Fern A. Goulding, A.B., R.N., Associate Chairman

Progress Report of the National Survey of College Nursing

2:40—(B) Committee on Health and Physical Activities, Irvin W. Sander, M.D., Chairman
Infectious Mononucleosis—C. J. D. Zarafonetis, M.D., Associate Professor of Internal Medicine, University of Michigan Medical School

3:15—(C) Committee on Administration, J. G. Grant, M.D., Chairman
Panel Discussion: The Changing Problems of Administration in Student Health Services
Panel Members: Ruth E. Boynton, M.D., University of Minnesota; Ruth M. Collings, M.D., Woman's College of University of North Carolina; John E. Sawhill, M.D., New York University; J. G. Grant, M.D., Iowa State College
Discussion Leaders: Norman S. Moore, M.D., Cornell University; Warren Forsythe, M.D., University of Michigan; Grace Hiller, M.D., Goucher College
Session ends at 4:45 P.M.

Adjournment—Harry D. Lees, M.D.

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Editorial

NORTH DAKOTA PHYSICIANS COOPERATE IN IMPROVING STATE MEDICAL SERVICES

During the past decade and particularly since the close of the last great war people have been taking more interest in their government. Many political action groups have grown into being. Man has learned that the course of government can be affected in matters of economics as well as in matters politic by the means of organization. It should not be surprising then that people in North Dakota are indicating a keen interest in such questions as improvement of their educational system and improvement of their health. To the doctor this somewhat newly developed interest may seem an unwarranted meddling in the individual affairs of the practicing physician. The business executive must have felt the same way when working men found that through organization their will could be imposed against their employer. In a way these efforts by the people are nothing more than an application of the doctrine so well known to merchants that "the customer is always right." Yet the idiom "the customer is always right" is not always a truism. "The customer" is an individual and like you or me is capable of being right or wrong. Further he is apt to be more right the more familiar he is with the subject on which he expresses his opinion and more wrong when he is less familiar with his subject. This much though is true—"the patient" whether right or wrong is going to make up his mind as to whether or not he likes the medical service he is getting. If he has a tendency not to like it there will always be a group ready to fan even a mild feeling of dislike into something much more serious. Because physicians should be more familiar with matters concerning health than John Jones down the street, they should be and are taking a responsible place of leadership in attempting to find the proper solutions to problems in the field of distribution of medical care. Their efforts and leadership must be expanded, and at the same time the leadership must take cooperative counsel with "the customer" and incorporate as many of his ideas as are sound. "The customer" must be made to feel and *actually have a part* in the satisfactory settlement of these problems.

The North Dakota State Medical Association has done much in past years to improve the rendition of medical services. While probably not as well known as it ought be, our cooperation with the North Dakota State Health Department in developing such programs as Venereal Disease Control, Tuberculosis Control, the Blood Bank for Plasma and the procurement of enabling legislation for the development of District Health Units, to name a few projects, has been real. Likewise North Dakota doctors have made substantial contributions to the Public Welfare Board's Crippled Children, Aid to the Blind, Aid to Dependents and Old Age Programs. Further, like contribution has been made to the Workmen's Compensation Bureau. The Association is proud of its program worked out with the Veterans Administration for the Home Town Care of the G.I. by his family physician. It feels that it was on the right track when during the last legislative session it aided nurses in North Dakota in the passage of the bill for the licensure of practical nurses. This bill should aid in the solution of training an adequate number of nurses able to give bed care for patients. North Dakota doctors are awakening to the contribution which can and will be made by the non-medical groups and welcome the expanded representation on the North Dakota Health Council, the governing body of the State Health Department. Further, as but one organization of many organizations of high purpose represented on the Governor's State Health Planning Committee, we are working for the establishment of soundly located new hospitals in North Dakota under the Federal Hospital Construction Act. We, with the aid of the local communities, are doing what we can to encourage doctors of high caliber to engage in practice in our rural communities which, during the war, found their doctors leaving for military service. With the aid of "the customer" we will continue to strive for a sound solution of the problem of finding an improved method for the payment of medical care, particularly for those upon whom it falls as a considerable burden.

PHILIP G. ARZT, M.D., President,
North Dakota State Medical Association

FOR WORLD HEALTH

Something new under the sun is an organization supervising the health of the world as a whole. Such a group, consisting of medical and health experts from 64 nations, is to convene in Geneva, Switzerland, June 24. The object of the convention is to establish a permanent agency of the United Nations to apply the principles of health and sanitation on a world-wide scale.

A comprehensive program is to be brought up for the approval of the convention. It will provide for the assistance of medical relief and research work throughout the world, for the handling of epidemics from a world viewpoint, and for advice to the United Nations on public health problems.

A commission acting in the interim before the organization is completed has already sponsored a mass scheme for immunization against tuberculosis in Poland. A campaign is being mapped to deal with venereal disease among children, pregnant women and nursing mothers. In the event of a widespread epidemic of any disease, cabled bulletins will be sent out, and protective sanitary measures for traffic between nations will be supervised and made uniform.

The epidemic of what was called Spanish Influenza, which caused such havoc in many parts of the world after World War I, might have been halted and stripped of some of its disastrous consequences had such an organization existed at that time. With travelers constantly girdling the globe, the prevalence of disease in one

(Continued on page 154)

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country may easily lead to its incidence in another thousands of miles away. The world health project is very properly made an important concern of the United Nations.—(Editorial, *The Minot Daily News*, March 8, 1948.)

NO SHORTAGE OF DOCTORS?

The American Medical Association attacks as "unwarranted and unjustified" the alarm about any shortage of physicians in the United States by 1950. The A.M.A. *Journal*, which made the denial, calls on the United States public health service, which forecast the shortage, to restudy its figures and estimates. The Association contends that a recommendation by Dr. Thomas Parran, outgoing surgeon-general of the service, for a 50 per cent increase in the output of physicians would result in a "tremendous lowering of the standards of medical education."

The medical association may be right that a lowering in standards could result from a 50 per cent increase in the number of medical students. But it is not going to convince the people in the rural areas and small towns of North Dakota that there is no doctor shortage when so many of them have to travel 50 miles and more to see a physician.—(Editorial, *The Fargo Forum*, March 4, 1948.)

A.M.A. URGES SYSTEM FOR EMERGENCY NIGHT SERVICE

The American Medical Association calls on county medical societies to meet the public demand for emergency medical service at night.

"From many sections of the United States," says an editorial in a recent (March 6) issue of *The Journal* of the American Medical Association, "complaints have come lately that persons who have called physicians late at night have been unable to secure attendance from either those whom they considered their family physicians or from specialists or, indeed, from any physician."

The American Medical Association says that large county medical societies or urban groups should maintain a physicians' telephone exchange which would take the responsibility for locating physicians if response is not made to the ringing of the telephone in the home or in the office.

The solution is simple and practical, requiring only a minimum of community organization. A number of county medical societies already maintain a physicians' telephone exchange where doctors' calls may be received and doctors located if their office or home telephones do not respond. Such an exchange can be utilized as at night or on holidays, simply by furnishing the exchange with a list of physicians who are able and willing to make night calls. Such physicians would probably include the younger general practitioners, newcomers to the community, and others in general practice. If such a roster were available, and its availability widely publicized, night calls for medical service would soon gravitate to this center and the patient would be assured the services of a physician.

Under such a system the necessity for calling many doctors would be eliminated. Two calls at most would be necessary. Where there is no physicians' telephone service, it might be possible to have the hospitals cooperate by handling such night calls.

It is highly important that where such arrangements exist they be brought to the attention of the lay people in the community through appropriate public channels, not once but repeatedly, to keep the shifting populations well informed.

Few problems in the field of medical service have aroused so much public discussion. Whether resentment against physicians is justified or not, it does harm. The solution for this problem is so eminently simple and would reflect so favorably upon physician-patient relationships that medical societies everywhere are urged to give it serious consideration immediately.

An independent physicians telephone exchange as well as a direct wire service is available to physicians in the Twin City area.

. . . NEWS ITEMS . . .

NORTH DAKOTA

Dr. C. M. Lund, Williston physician, has been appointed county health officer replacing Dr. H. T. Skovholt, who is now in San Francisco with the Veterans Administration. Dr. Lund also will act as district health officer according to Dr. Alan K. Johnson, chairman of the district board of health. The district health office covers Williams, Divide, and McKenzie counties.

Mrs. Ethel Heising, nutritionist with the North Dakota state health department, has been named nutritionist in charge of 14 southwestern North Dakota counties, Dr. R. O. Saxvik, state health officer, announced. Mrs. Heising's headquarters will be in Bismarck.

Dr. M. E. Beltz is now associated with Dr. E. R. Wasemiller in Wahpeton.

Dr. J. P. Bartle, who had practiced medicine in Langdon since May 1937, terminated his practice in Langdon February 25 for a year's graduate study in internal medicine, specializing in cardiology.

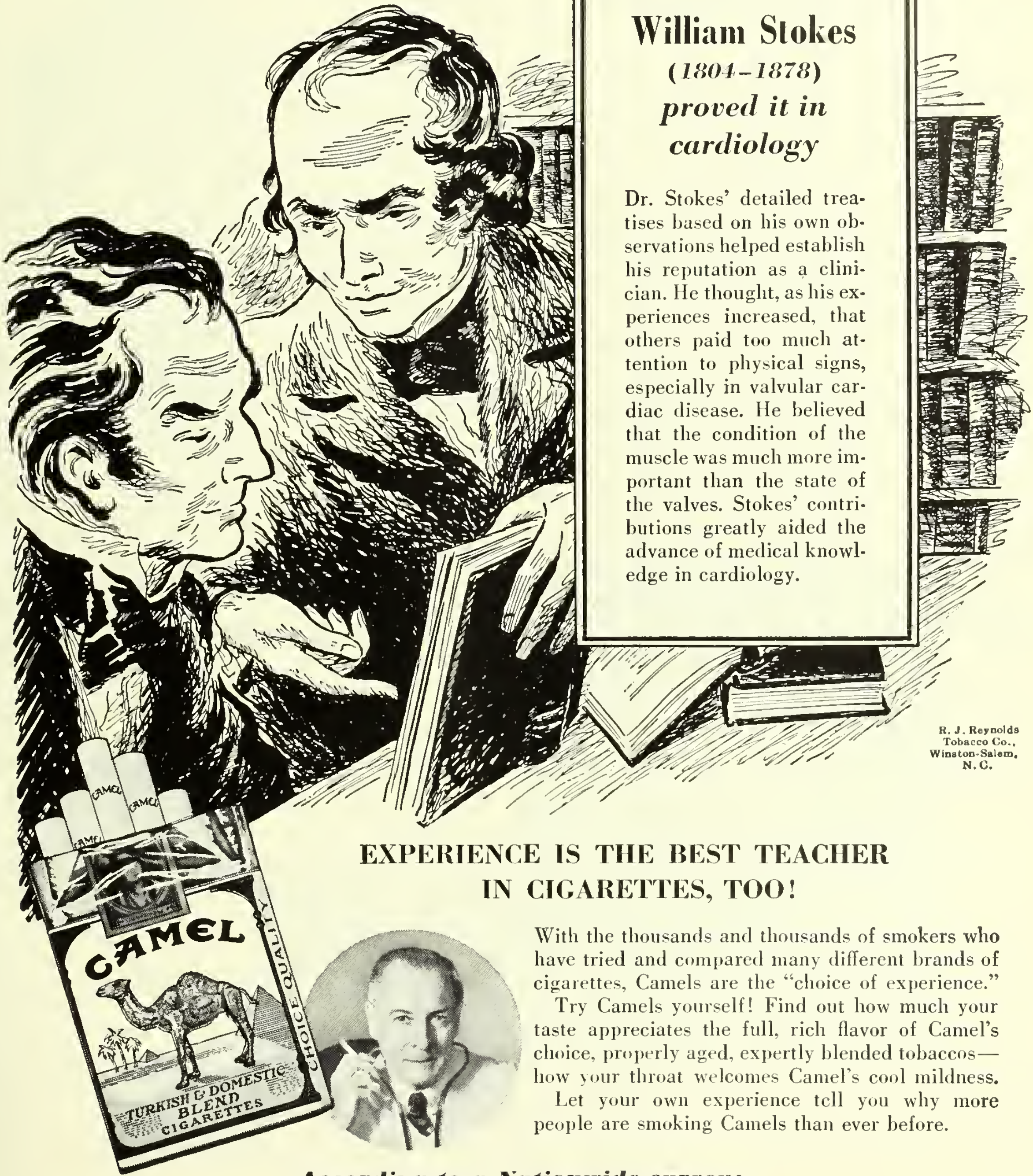
Members of the Jamestown chapter of the North Dakota Medical Association Auxiliary had a dinner meeting in February.

Mrs. P. G. Arzt, Jamestown, president of the state organization, presided in the absence of Mrs. C. W. Robertson, Jamestown, who is out of the city.

Mrs. John Elsworth gave a report on "Prepayment

(Continued on page 156)

Experience is the Best Teacher



William Stokes
(1804–1878)
proved it in cardiology

Dr. Stokes' detailed treatises based on his own observations helped establish his reputation as a clinician. He thought, as his experiences increased, that others paid too much attention to physical signs, especially in valvular cardiac disease. He believed that the condition of the muscle was much more important than the state of the valves. Stokes' contributions greatly aided the advance of medical knowledge in cardiology.

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Let your own experience tell you why more people are smoking Camels than ever before.

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More Doctors Smoke CAMELS than any other cigarette

Three leading independent research organizations in a nationwide survey asked 113,597 doctors what cigarette they smoked. The brand named most was Camel!

Medical Plan." Plans for the coming state convention here May 23, 24 and 25, were discussed.

Five communities, mostly in western North Dakota, were allocated $241,338.42 in federal funds to build hospitals. The money was earmarked from a federal appropriation by the state health planning committee. Largest allocation, $76,000, went to the Griggs county hospital at Cooperstown, said E. J. Haselrud of Fargo, committee chairman. Other allocations were: Tri-State Hospital association, Bowman, $59,567; McKenzie county Community Hospital association, Watford City, $35,033.33; Lorenzen Hospital, Elgin, $9,204.76; and Community Memorial hospital, Hettinger, $60,933.33.

With a contingency fund of some $18,000 to care for cost fluctuations, there was not enough left from the $308,000 total federal appropriation to make an allocation for the Garrison Community hospital, said Dr. R. O. Saxvik, state health officer and a committee member. The committee therefore placed the Garrison project and its allotment of $78,546.66 in a top priority position for next year. No appropriation has been definitely voted by congress for next year, but committee members hope for an amount similar to this year's $308,000.

Each individual allocation represents one-third of the estimated cost of the hospital, with the community putting up two-thirds.

Next step for the communities granted the money is to get a construction contract approved by the state health department and the surgeon general's office. They may then begin to build, with the first 25 per cent of the allocation advanced when the building is 25 per cent completed. Remainder of the money will be advanced as contruction proceeds.

Tentative proposals to establish a mental hygiene public health service in North Dakota were discussed in February by a group of doctors, educators, public health officials and other interested persons at a meeting in the Bismarck junior college.

Dr. Walter Swensen, dean of the college, and Rev. Eldred Murdoch, an instructor there, submitted a plan for a mental hygiene set-up which they had formulated with the co-operation of the state health department.

It provides for an educational program and the establishment of mental hygiene clinics. Swensen and Murdoch's outline declared that "Under the educational program it shall be our aim to work through existing organizations for the education of their members as parents of children and fellow social beings to build up a pattern of living which makes well-adjusted living as much of a reality as are our academic, trade and professional curricula."

The service angle of the plan calls for the establishment of mental hygiene clinics where the services of psychiatrists, psychologists and psychiatric social workers will be available to those who are suffering from maladjustments.

Dr. Russell Saxvik, state health officer, said these clin-

(Continued on page 160)

POST-OPERATIVE INSOMNIA

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*"Injection Treatment of Varicose Veins and Hemorrhoids," 2nd Rev. 1939, page 186, by McPheeters and Anderson. (Dr. H. O. McPheeters, F.A.C.S., was formerly head of the Varicose Vein and Ulcer Clinic at the Minneapolis General Hospital.)

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MINNEAPOLIS MINNESOTA

ics should be operated on a community basis, with each community being responsible for its own clinic.

He said the public health department is considering initiating a pilot clinic in Bismarck if great enough demand for such service is evident. The accomplishments of the pilot clinic would demonstrate to other communities the value of mental hygiene work.

SOUTH DAKOTA

Formal announcement of the affiliation of Dr. Thomas W. Reul with the Bartron hospital and clinic, Watertown, has been released at the clinic by Dr. H. J. Bartron following approval of Dr. Reul's application for a license to practice in the state of South Dakota in February.

Although Dr. Reul has been in Watertown for a considerable time, his actual affiliation with the Bartron staff has been deferred, during the necessary wait for the recent session of the state board of medical examiners to consider and act on his application for a South Dakota license.

Dr. Frank Lima, former Mobridge and Hoven surgeon who was to be in charge of the new McLaughlin hospital now under construction, notified S. C. Hatch, president of the McLaughlin Hospital association, that he would be unable to return to McLaughlin from New York to comply with his contract with the association, because of ill health.

Dr. Cloid D. Green has recently opened an office in Parker.

Dr. Clark Fennerud Johnson is now affiliated with Drs. R. F. Hubner and Merritt Auld in Yankton.

Dr. Clifford F. Binder, formerly of Tripp, has become associated in practice with Drs. Tobin, Tobin and Moran in Mitchell.

Dr. H. O. Kittelson, son of Dr. John A. Kittelson, has entered practice in Sioux Falls in partnership with his father.

Dr. Frederick Rosenfield, formerly of Phelps, Wisconsin, has now located in Philip.

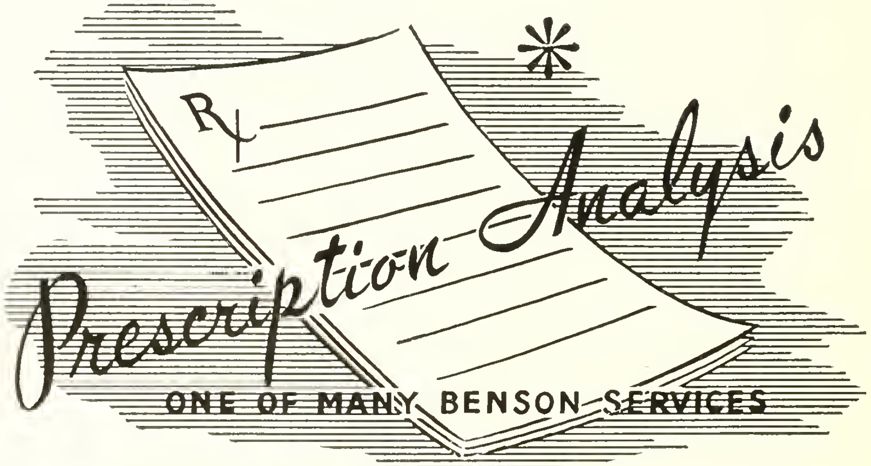
Heart disease killed more South Dakotans last year than the next three leading causes of death combined.

The state board of health, in its annual report, listed 1,726 deaths from heart ailments. Cancer took 739 lives, apoplexy 517, kidney disease 299, and pneumonia 235. Tuberculosis deaths numbered 185.

The report showed 148 deaths from diabetes. Senility caused 83, influenza 37, appendicitis 32, syphilis 31, and diarrhea and enteritis 18.

Gallbladder disease was the cause of 17 deaths, whooping cough 10, duodenal ulcers 9, gastric ulcers 8, peritonitis 7, mumps 3, infantile paralysis, meningitis and tetanus 2 each, and measles and diphtheria one each.

(Continued on page 162)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The six leaders in communicable diseases last year according to the report were measles, 1,280 cases, syphilis 510, gonorrhea 499, chickenpox 478, tuberculosis 333, and scarlet fever 279.

The board's laboratories performed 163,026 tests and examinations during the year, the report said, including 121,305 blood tests for syphilis.

Public health nursing activities included 17,991 visitations and 18,719 field nursing visits, immunizations and vaccinations for communicable disease control. Maternity service cases numbered 1,123. Thousands of other cases were handled in venereal disease control, tuberculosis control, infant and preschool hygiene, school and adult hygiene, morbidity nursing service, crippled children's service and group education.

Under the board's emergency maternity and infant care program, 5,711 maternity cases were authorized and 5,556 completed from May 23, 1943, to the end of 1947. Infant cases numbered 1,825 authorized and 1,701 completed. Expenditures in the period totaled $594,909.

The maternal and child health divisions' annual report showed 13 health examinations, 105 infant and preschool tests, 371 immunizations and 16 dental cases. Literature distributed included 14,655 bulletins, pamphlets and letters.

The crippled children's division had 2,424 children under care. It held nine clinics and completed or removed from the register 146 cases.

A total of 51,737 persons in 658 showings saw the 76 health films in the board's library.

For the fiscal year 1946-47, the board listed receipts of $598,290 and expenditures of $511,973.

MINNESOTA

Dr. George N. Aagaard was appointed by the Board of Regents of the University of Minnesota to succeed the late Dr. William A. O'Brien as director of postgraduate medical education at the University. His new appointment, effective March 1, carries the rank of associate professor of medicine.

Three appointments to the State Board of Health and Vital Statistics were made February 26 by Governor Youngdahl. Dr. Ruth Boynton of Minneapolis and Leo M. Thompson of Little Falls were reappointed to the board while Dr. Theodore H. Sweetser of Minneapolis was appointed to replace Dr. Erling S. Platou of Minneapolis, board member since 1933. The appointments are for three years each. John A. Johnson of Minneapolis was named by the governor to the county welfare merit system council for the term ending December 31, 1950.

Dr. F. M. Feldman, Rochester, city health officer for the past seven years, resigned in February to accept a position with the U. S. Public Health Service in Washington. Dr. Feldman will be director of the central coordination and analysis office of the tuberculosis section. Dr. R. J. Jackman, president of the city board of health and welfare, said the resignation probably would not be effective until at least June 1, or until a successor is appointed.

(Continued on page 164)

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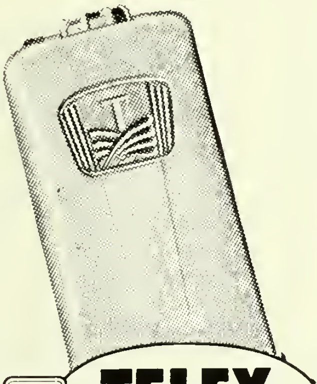

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First Term June 14-July 24
Second Term July 26-August 28

Courses for:
- Practicing Physicians
- Medical Students in the Clinical Years
- Medical Students in the Preclinical Years

General Information

During the summer of 1948 the Medical School and its affiliated hospitals will offer instruction in the preclinical and clinical fields of medicine.

Registration by the following is invited: (a) practicing physicians, (b) students from other medical schools upon recommendation of their respective deans, (c) students at the University of Minnesota Medical School who may register on a voluntary basis.

Regular Basic Science and Clinical Courses

Courses which are part of the regular medical curriculum, as well as electives, are offered in the following departments: Anatomy, Bacteriology and Immunology, Medicine, Obstetrics and Gynecology, Ophthalmology and Otolaryngology, Pathology, Pediatrics, Pharmacology, Physiological Chemistry, Physiology, Psychiatry and Neurology, Radiology, School of Public Health, Surgery.

For descriptive literature covering individual courses by departments, address: DEAN OF THE SUMMER SES-

(Continued on page 165)

ULTRAVIOLET WATCHMEN

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sion, 880 Administration Building, University of Minnesota, Minneapolis 14, Minnesota.

Special Clinical Courses

The clinical facilities of the University Hospitals, Minneapolis General Hospital, Veterans Hospital, and other affiliated teaching hospitals of the Medical School are available for *special clinical instruction* of practicing physicians, junior and senior students from other medical schools who are properly qualified, and juniors and seniors at the University of Minnesota Medical School during the Summer Session, 1948.

These clinical courses are designated as externships and will consist of ward responsibilities, bedside teaching, conferences and other exercises listed under the several clinical departments. Clinical service will occupy approximately three-fourths of the registrant's time. The balance of the day will be available for electives in the same department or in other departments, including basic science departments.

Registration may be for either or both terms of the Summer Session. Researth opportunities may be afforded registrants who remain for both summer terms. At the discretion of individual clinical departments, selected registrants may remain during the month of September for additional clinical training.

A fee of $35.00 per term for the externships is charged. This is the same for residents and non-residents of Minnesota. In addition each registrant for an externship will pay an incidental fee of $6.00 per term. For information concerning fees charged for courses other than the externships, see the regular Bulletin of the Summer Session.

For information concerning Summer Session work creditable toward advanced degrees with registration in the Graduate School, see Bulletin on Graduate Work in Medicine.

Department	Directed by	Limitation of Enrollment
MEDICINE		
Externship in Medicine	Dr. C. J. Watson	54 per term
Externship in Dermatology	Dr. H. E. Michelson	10 per term
PSYCHIATRY AND NEUROLOGY		
Externship in Neurology	Dr. A. B. Baker	10 per term
Externship in Psychiatry	Dr. D. W. Hastings	10 per term
OBSTETRICS AND GYNECOLOGY		
Externship in Obstetrics and Gynecology	Dr. J. L. McKelvey	10 per term
PEDIATRICS		
Externship in Pediatrics	Dr. Irvine McQuarrie	30 per term
RADIOLOGY		
Externship in Roentgen Diagnosis and Radiation Therapy	Drs. Leo Rigler and Karl Stenstrom	8 per term
SURGERY		
Externship in General Surgery	Dr. Owen Wangensteen	30 per term

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July 19 to July 31, 1948

Denver, Colorado

A two weeks course in chronic chest diseases with special emphasis on tuberculosis is presented. The course has been arranged by the Regional Committee on Postgraduate Education of the American Trudeau Society, in conjunction with the University of Colorado School of Medicine. The committee is composed of Dr. James J. Waring, Chairman, Dr. Dumont Clark, Co-chairman; Drs. John F. Allen, Fred R. Harper, Allan Hurst, Carl Mulky, and for the medical school, Dr. Robert S. Liggett.

Registration. The maximal registration is 40. This course is intended primarily for physicians who have special interest and training in chronic chest diseases and who reside in the following states: Colorado, North Dakota, South Dakota, Nebraska, Kansas, New Mexico, Arizona, Utah, Wyoming, and Montana. In assigning applicants, preference will be given to residents of these states, although applicants from other areas will be given due consideration. As far as possible, applicants will be assigned in order of receipt of application.

Applicants should write directly to Elizabeth Stoltenkamp, Administrative Assistant, American Trudeau Society, 1790 Broadway, New York 19, N. Y., requesting application blanks. Notification of acceptance will be made by June 21, 1948. No applications will be accepted after June 14, 1948. Matriculation cards will be mailed thereafter to accepted applicants on receipt of the full fee for the course.

Physicians are respectfully asked not to request the privilege of "sitting in" to hear some of the lectures without formal registration, as space assigned for classes is limited.

Fee for Course: One Hundred Dollars. At least half of the registration fee shall be paid at the time of filing application. The advance payment will be refunded by the society to any registrant who, for adequate reason, is unable to pursue the course, provided notice of withdrawal is registered not less than six weeks before the opening of the course. Checks should be made payable to the American Trudeau Society.

Hotel Accommodations. Hotel rooms have been reserved at the Shirley-Savoy Hotel, Denver, Colorado. Confirmation of reservation will be mailed to those enrolling in the course.

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  Surgical Technique, Surgical Anatomy and Clinical Surgery, four weeks, starting April 26, May 24, June 21.
  Surgical Anatomy and Clinical Surgery, two weeks, starting April 12, May 10, June 7.
  Surgery of Colon and Rectum, one week, starting April 26, May 24.
  Surgical Pathology every two weeks.
UROLOGY: Intensive Course, two weeks, starting April 12.
FRACTURES & TRAUMATIC SURGERY: Intensive Course, two weeks, starting June 7.
OPHTHALMOLOGY: Intensive Course, two weeks, starting May 10.
  Ocular Fundus Diseases, one week, starting June 7.
GYNECOLOGY: Intensive Course, two weeks, starting April 26, June 7.
  Vaginal Approach to Pelvic Surgery, one week, starting April 19, June 21.
OBSTETRICS: Intensive Course, two weeks, starting April 12, June 21.
MEDICINE: Intensive Course, two weeks, starting April 26.
  Personal Course in Gastroscopy, two weeks, starting June 28, July 12.
  Electrocardiography and Heart Disease, four weeks, starting May 3.
  Hematology, one week, starting May 10.
  Gastroenterology, two weeks, starting May 24.
DERMATOLOGY: Formal Course, two weeks, starting April 26.
  Clinical Course every two weeks.
ROENTGENOLOGY: Every two weeks.

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Deaths

Dr. Fred W. Gaarde, 59, senior consultant in medicine at the Mayo Clinic in Rochester and associate professor of medicine at the Mayo Foundation and the University of Minnesota postgraduate school, died February 10 in Rochester.

Dr. L. W. Anderson, 66 years old, who had been a practicing physician in Atwater, Minnesota, more than 40 years, died in February.

Dr. C. F. Carstens, 68, a member of the medical profession in Hibbing, Minnesota, for 34 years, and a partner in the Mesaba Clinic, died February 19.

Dr. T. C. Patterson, 84, commandant of the North Dakota Soldiers home and a resident of the Cogswell and Lisbon area for 59 years, died February 22. He was regimental surgeon of the First North Dakota regiment of the national guard and served with it on the Mexican border and in World War I.

Dr. Theodore F. Hammermeister, 60, physician and surgeon and health officer for the city of New Ulm, Minnesota, for about 10 years, died February 14.

Classified Advertisements

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PREPARATION OF MANUSCRIPTS

JOURNAL-LANCET extends an invitation to the profession for articles with the understanding that they are original contributions not previously published.

Manuscripts are to be typed on one side of the paper with double spacing. Illustrations must be in the form of glossy prints or drawings in black ink. Please do not attach legends to the pictures. A reasonable number (two or three) illustrations are published free of cost; special ararngements must be made for excess or highly finished illustrations or tables.

Bibliographic references should be at the end of the manuscript and not in footnotes. Each reference should include the following information in the order indicated: Name of author with initials; title of article; name of periodical; volume, page and year. Reprints are prepared on order.

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The JOURNAL LANCET

Minneapolis, Minnesota
May, 1948

Vol. LXVIII, No. 5
New Series

Asthmatic Children

Ralph Bowen, M.D., F.A.C.P.
Houston, Texas

The asthmatic child is one of the most important patients seen in pediatric practice. He is the child often deprived of routine sports, made to miss school because of illness, forced to forego many foods, and last but not least, if not diagnosed early, may develop physical handicaps which frequently jeopardize his future in a gainful occupation.

As a small infant, he may present signs of colic, vomiting, diarrhea, and constipation. Excessive sneezing and a blocked nose may produce nursing difficulties. During the winter he may have croup and several attacks of so-called pneumonia.

One group of several hundred asthmatics revealed that 20 per cent had eczema as an infant, and that 50 per cent of the eczematous children developed asthma. From these observations we can appreciate the fallacy of the old saying: "Don't worry, mother. Your baby will outgrow his eczema." Therefore, we, as physicians, in the management of eczema cases, should realize that we are not only correcting a skin condition but are also trying to minimize a later asthma and the complications of other allergies.

HISTORY — HEREDITY

The importance of obtaining a good history cannot be over-emphasized. In taking the history we should learn more about his medical past, his environment, diet, and locale. From these points, we can better direct therapy.

On careful inquiry you can find that most of these children show a positive antecedent family history of allergy. In our own group,[1] 90 per cent had a positive hereditary factor.

In keeping with Vaughan,[2] we, too, observed that when the inheritance was bilateral nearly 90 per cent of the children developed the disease within the first ten years of life. When the inheritance was unilateral about 30 per cent developed the symptoms within the first ten years.

PHYSICAL EXAMINATION

A complete physical review is essential and in all cases exclude an organic condition before you make the diagnosis of allergy. Consider the state of nutrition, endocrine possibilities, and foci of infection in all systems.

Roentgenoscopy of the chest and roentgenograms of sinuses should be a routine. Also, make a complete examination of the blood and nasal smears for eosinophiles. Eosinophiles are more commonly found in blood smears during the periods of recovery than at the time of actual attack. Therefore, we consider an increase in number as suggesting that child is on the road to recovery.

NASAL PROBLEMS

Children who have nasal allergy give the impression of having chronic colds. On awakening they sneeze frequently and blow from the nose a thin, watery, mucoid material which by 10 A.M. is a minor complaint. In other words, their "colds" get better by noon.

We have noticed that almost all children with chronic nasal allergy develop the habit of rubbing the nose, which I have termed the "allergic salute." It is done with a side to side, rotary or upward stroke, the latter being the most common. It can be safely said that children who are chronic nose rubbers or mouth wrinklers can be called allergic until proved to the contrary.

When it is not convenient for a child who suffers from

an itching nose to use his hand to relieve the symptom, he attempts to overcome his discomfort by wrinkling his nose or twisting his mouth.

As suggested by Hansel,[3] an accurate diagnosis of nasal allergy can be made on the clinical history, the nasal changes, the roentgenography of the sinuses, the bacteriology, the cytology of the nasal secretions and the histopathology of the nasal and paranasal sinuses. There is one procedure which every physician can do irrespective of his specialty, namely, a study of the cytology of the nasal secretions, with particular reference to eosinophiles. Often an infant or a small child who is thought to have frequent colds will be recognized as being allergic by this "nasal smear test."

Food as a Factor

The nutritional history of the allergic infant frequently divulges colic, vomiting, and diarrhea. Numerous formulae changes are tried.

Although the majority of allergic children under ten years of age are definitely sensitive to one or more foods, there is only one child in a hundred sensitive to food alone. In addition, we must always consider environmental factors and infection.

In caring for the allergic child, one is impressed by the fact that these children's diets are frequently unbalanced. Many times important foods are excluded for too long a period. Therefore, it behooves us to provide a suitable diet, even at the expense of permitting some symptoms to recur or persist. We must also remember that we are treating the child as well as his allergic condition.

Wheat. In instances where wheat is the factor we must remember that rye bread is 20 to 35 per cent wheat. It is also found in certain meats, such as wieners, used as a filler, in some brand of corn, and often in salad dressings. Corn bread bought at cafes usually contains wheat, and this is also true of some buckwheat flours.

Minerals. On an empirical basis, we give dicalcium phosphate to this group of children. So that—where there is true milk sensitivity—we give the same mineral equivalent as found in milk.

Cottonseed Oil. This is commonly found in Wesson oil, Crisco, oleomargarine, packing sardines and tuna fish, olives, anchovies, and mustard, as well as in salad dressings and used in frying potato chips and doughnuts. Interestingly, there has not been a proven case of cottonseed oil sensitivity in the literature—and this has been so confirmed by Dr. Karl Figley.

Egg. At present, pediatricians advise the early inclusion of egg yolk in the young infant's diet. In any case where there is a definite allergic background, this program should be followed cautiously.

Any child sensitive to egg cannot tolerate the amount found in baking powders. Where such cases exist we must use "K.C." and "Royal" baking powders, for these are known to be free from egg.

Any patient who is extremely sensitive to egg will have to exclude all egg-containing foods, and some will find it necessary even to exclude hen meat. Remember that egg white is far more allergic than the yolk. Therefore, when later added to the diet, start out with feeding the yolk.

It has been shown that egg is a common offender since it has the lowest coefficient of digestibility of any protein.

Milk. Ratner [7] has noted that "dried powdered milks" are more likely to precipitate a potential allergy and suggested instead that we use "unsweetened evaporated milk," thus making for more complete digestion and diminishing the probability of the absorption of native antigens through the intestinal wall.

One can, in the home, further super-heat the unsweetened and evaporated milks by placing the unopened cans in boiling water for 15 to 30 minutes.

Milk Substitutes. Mull-soy is a soybean mixture and an excellent preparation for the known milk allergy case. Some children may have an increased number of bowel movements on Mull-soy. Another excellent milk replacement is Allerteen. Also, remember evaporated goat's milk. My experience with Nutramagin has not been good.

Sugars. One always has to consider the different carbohydrates used in the infant's formula. Ratner [8] has shown that pure corn syrups, pure dextri-maltose, and crystalline sugars play no role in allergy. However, Randolph recently presented before the Academy of Allergy, 1947, proven cases of corn syrup sensitivity. One case in particular was a proven case of corn sensitivity, who, by using an ordinary paper drinking cup, could get sufficient corn antigen from the corn sizing in the cups to provoke an acute attack of asthma. Randolph denoted corn on many paper containers with the iodine test. Dextri-maltose containing wheat germ or yeast may be definitely anaphylactogenic, and particularly malt preparations, since the original protein constituent, hordein, present in allergy, is a frequent troublemaker. I have never seen a proved case of allergy to cane sugar.

Vegetables. Today the allergist and the pediatrician must be familiar with the various brands of canned baby vegetables and soups for often these contain an offending food. It is best to give non-mixed vegetables and to rotate the menu.

Antirachitic Oils. We have shown that codliver oil[9] and other antirachitic oils at times have been responsible for "upsets" in the eczematous and asthmatic child, and in such cases we have successfully been able to substitute Carotene with Vitamin D, SMACO product 525,—now known as Provatol, by Wyeth, which is put up in a sesame oil base. The dose for infants, 8 drops; children 1 to 12 years, 12 drops.

Vitamin C Foods (Orange, Tomato). At times both orange and tomato juice are poorly tolerated, but, fortunately, this situation can be met by giving vitamin C. Occasionally, the orange juice can be tolerated if strained through a fine mesh, and one should avoid the volatile oils from the rind by using light pressure during squeezing.

Investigation of allergic patients reveals a normal blood level of vitamin C. Contrary to popular claims, I have seen no benefit from the administration of large doses of vitamin C.

Often we are asked what value there is in hyposensitization of foods by injection. In our experience it is a method not free of danger, and, as a routine procedure, it is condemned.

Elimination Diets

The exclusive management of any asthmatic child by the elimination or trial diet will prove a failure in over 90 per cent of all cases since this regime does not care for the inhaled or contact substances. One should always keep known facts uppermost in mind and should endeavor to use common sense. For example: if positive skin reactions are obtained, one is not justified in saying these foods should never be eaten because there are two possibilities: First, it is known that sensitization is usually multiple and that some children give positive reactions to foods before they are clinically sensitive. Secondly, there is the other extreme that a positive skin reaction may be retained after an apparent clinical cure has been effected.

Therefore, in arranging a diet, remember it is imperative that you state specifically which foods can be eaten and not just say your child should not eat the following. Remember that some allergic patients can handle some foods, perhaps once a week, but not for three or four days in succession. It is not necessary to remove foods for intervals of months as we once did because if good effect is going to be established it should be manifested in a matter of days—providing environmental factors are also controlled. Remember, too, that food testing gives less than 40 per cent reliable information.

Food Dislikes

We do not believe that any definite statement can be made in regard to the relationship of the child's appetite and his symptoms. Some children are very fond of certain foods to which they are sensitive and which have proved to be toxic for them, while others have a strong dislike for the majority of foods to which they are sensitive. There is convincing evidence that some children are so mildly sensitive to foods that it may require days before symptoms are produced, which probably accounts for cyclic phases of symptoms. We may conclude, therefore, that while dislikes may occasionally be indicative, they cannot be accepted as a true guide.

Tonsillar and Adenoidal Hypertrophy and Infection

The question is raised constantly: "Should I have the child's tonsils removed?"

We have found that over 72 per cent of our children, referred because of asthma and hay fever, have already had their tonsils and adenoids removed. Many parents were deluded to believe that a cure of the child's asthma would occur. It is our opinion that more conservatism should be followed with reference to operation, and tonsillar disease is not more prevalent in allergic conditions than otherwise. We must also be conservative in doing any nasal surgery during a season when a person's allergic state is causing trouble.

We have observed that allergic children frequently have to have more than one adenoidectomy or tonsillectomy because their pharynxes are usually studded with lymphoid nodules. When such throats are seen be suspicious of allergy. This also explains why the physician may be credited with not having done a thorough original operation. One has to be very charitable when discovering tonsil tags in these cases because there is a tendency for recurrence.

Local Treatment. The fewer "nose drops" used in an allergic nose the better. Avoid oily ones since they have been responsible for pneumonic conditions. Never use heavy metals and never give argyrol since it frequently proves most irritating.

Neo-Synephrin ¼ per cent to ½ per cent is excellent. Privine .05 per cent is also excellent, but use cautiously since it frequently produces secondary congestion. Irradiation of the nasopharynx with the radon or radium applicator should be considered as an additional method of treating asthmatic children when nasopharyngoscopic examination reveals residual lymphoid tissue. But this is always to be done by an otolaryngologist.

Asthmatic Stages

Before diagnosing a child as being asthmatic, we must exclude all conditions mimicking this condition. First, consider foreign bodies, tumors, mediastinal, and pulmonary disease. One must also consider cystic fibrosis of the pancreas with its pulmonary aspects which may simulate asthma. Ayerza's disease is another syndrome for exclusion. Eyermann[4] defines true allergic asthma as a recurrent paroxysmal dyspnea, particularly manifested in the expiratory phase, due to an allergic reaction in the bronchioles resulting from the absorption of a substance to which the individual is hypersensitive.

According to Peshkin,[5] we may see the asthmatic syndrome divided into three distinct stages:

1. Respiratory oppression where the child complains of difficulty in deep breathing but no wheezing can be heard;

2. The "wheezing or pre-attack stage" is usually seen following an acute cold.

Some children never go into the typical attack stage. However, some do develop classical dyspneas, or (3) the "attack stage," which, occasionally, goes into status asthmaticus.

In the event the attack occurs early and too often, we see such complications as emphysema and chest deformity. Frequently these children will be free of all asthma until the return from school and activity from play will provoke an attack.

Allergic Bronchopneumonia

Many of these children give the history of having three or four attacks of pneumonia during the first few years of life. Characteristically, their pneumonias are severe but of short duration. In the older child of this type, we often see special nurses called as an emergency and the next day this same child is able to greet the physician at the door.

As a routine—when such a condition occurs—we give one or two minims of epinephrine and repeat as indicated. After such treatment, there is frequently an immediate drop in temperature. Miller[6] and others have shown that in this condition there may be a fever as high as 106° F. (41° C.) or no fever at all. On roentgenogram you will find little pathology but when present it is usually in the lower lobe near the mediastinum. Occasionally the acute may develop into a more chronic form. Complications are rare and the prognosis excellent.

One may also seen a syndrome of transient pulmonary infiltration with associated leukocytosis and eosinophilia. This eosinophilia may be as high as 50 per cent. It is of benign nature and non-responsive to sulfa drugs. This group of symptoms has been called "Loeffler's syndrome."

Special Reference to Factors in and About the Home

For the consideration of these facts, let us follow a child through the home during his daily routine and observe things which might precipitate an attack of asthma.

Bedroom

Temperature and Winds. The bedroom is the most important room of all, for here the child sleeps and plays. One should be very particular about the temperature, for during rainy or cold nights the damp air will frequently produce coughing spells and asthma. Therefore, insist that all windows be closed on such nights, and secure indirect ventilation from another room.

In the summer, winds from a nearby weed field, gin, or factory will carry allergens responsible for an attack of asthma. Therefore, it is well to arrange the bedroom on a side of the home with least wind. Many asthmatic children are upset during the rainy periods and frequently act as "storm barometers."

Mattress. Very often the mattress contains substances which produce difficulty. To minimize such conditions, it is advisable to cover the mattress with stork sheeting.

Pillows. The average child "buries" his nose deeply into a pillow about eight hours out of every twenty-four. Since feathers are common offenders, we urge that all pillows be covered with a good grade of rubberized silk or stork sheeting, with French-sewed seams which will aid in minimizing mold growth. A pillow is always preferred, since it eliminates to a degree, dust from the mattress. Remember, children become kapok-sensitive and under no circumstances can kapok be used by a cotton-sensitive individual. One of the most satisfactory pillow and mattress coverings can be obtained from the Expert Bedding Company, 2454 North Halstead, Chicago, Ill.

Blankets. Some children are troubled by woolen blankets, and as a routine, we advise the use of cotton covers.

Clothes Closet. Here the child frequently keeps his toy box as well as clothes. In this way he subjects himself to various materials, such as silks, furs, molds, and dusts. Closets should be cleaned carefully and kept clean in order to eliminate the above offenders.

Household Pets

Usually the first to greet a child in the morning is his dog or cat. Often the parent or a friend will obtain for these little patients some type of household pet for the sake of companionship, particularly since these children cannot participate in competitive play as freely as the average child. Therefore, warn the parents that all pets, such as cats, dogs, chickens, rabbits, mice, guinea pigs, and birds are poor friends and recommend, as suggested by Vaughan,[2] an alligator or gold fish. It is an excellent general rule that an allergic person should have no household pets. Therefore, if a child is found sensitive to pets, the procedure is obvious. Remember that these animals shed their hair and dander all over the home, so that after getting rid of the pet, it is necessary to clean all furniture thoroughly with an electric vacuum cleaner, *Rexair* being an ideal unit since the air is water filtered.

Hobbies

Glue Sensitivity (stamp collecting, kite making, airplane making). Many children when confined indoors develop hobbies of pasting pictures or collecting stamps in books. Recently we have had two children who developed asthma while arranging their stamps in books. In each case LePage's glue was being used. This suspected sensitivity was confirmed by further testing. LePage's glue has a fish base and is one of the most troublesome of all. United States postage stamps have no glue on them. The Post Office Department claims that only a vegetable adhesive is used.

The kite and airplane maker is frequently exposed to glues. It is, therefore, important to find out a child's hobbies in order to appreciate his environmental exposures.

Cosmetics

Face Powder (orris root). In the past, the average asthmatic child was literally bombarded with a common offender, orris root, which was originally obtained from the root of the iris plant. Also, many powders in the past contained this common ingredient. It is in many scented face powders, body powders, talcs, bath salts, face packs, astringent packs, cleansing powders and creams, scented tooth powders and shaving powders, soaps, many hair tonics, and some perfumes.

To protect a child against this factor in the home, one should obtain orris root-free cosmetics. At the present time there are several brands on the market, such as Marcelle, Ethex, Allercreme, Almay, Mansfield's Frost, Non-Allergic, and Arex. There will be some patients who continue to have trouble from orris root-free cosmetics and when this is true, it is necessary to try others. At times cosmetics will contain various cereal flours, such as rice, wheat, oatmeal, and corn flour. Remember, too, that perfumes can provoke an allergic upset.

Always warn the child who is orris root-sensitive to tell the barber not to use hair oils or powders on his hair, for they may be the cause of an attack of asthma. Also, remember that the church and the movie are environments containing orris root. Therefore, avoidance is nearly impossible, and in some cases, hyposensitization is indicated.

Insect Powders (pyrethrum). Nearly all insect powders or sprays contain pyrethrum, a substance obtained from a species of chrysanthemum. These, at times, produce severe attacks of asthma, particularly in those who are ragweed-sensitive. One has to warn mothers about the danger of insect sprays and furniture de-mothing agents which contain this product. A safe substitute is Cederene. It contains Lethane 384.

Medicine Cabinet

There are children who have typical allergic reactions after taking certain drugs. Aspirin and quinine are perhaps the most frequent offenders. Another common allergen is phenolphthalein found in many laxatives, such as Phenolax, Alophen, and Feenamint, and is often responsible for the "week-end" attack. Also, beware of iodines and some arsenic preparations. Now we have the antibiotics, such as penicillin and streptomycin. In other words, a physician should always make inquiry about other prescriptions which may have been used and always ask if any proprietary preparations have been recently administered.

House Plants

The pollens of the majority of beautiful flowers are heavy and, therefore, not windborne. However, when brought into the home, due to proximity, they are sometimes responsible for hay fever and asthma. Also, remember that pollen from the climbing vine near the bedroom window, from nearby trees or vacant lots, may cause much difficulty.

Furniture

Certain pieces of furniture, rugs, and draperies may contain various animal hairs responsible for trouble.

Baths

It is a good plan to bathe the asthmatic child in the morning and not during late evening. Very often the evening bath produces chilling, particularly in those cases who are prone to perspire excessively.

Father's Habits

Although smoking is not limited to the male, we have to be careful about father's pipe and cigar ashes and restrain him from excessive smoking, for tobacco smoke often acts as an irritant.

At times an avocation—horseback riding—may be a cause of the child's asthma from the dander on the father's riding habit. At other times a vocation, such as cow milking, may be a cause of the child's asthma from the cow dander on the father's overalls.

House Dust

During housecleaning the asthmatic child should be out of the home, since it has been observed that house dust is a universal offender. The specific factor is not definitely known but is probably a mixture of many allergens, including animal hairs, feathers, silks, and molds. To date our best dust antigen is the one perfected by Dr. B. G. Efron, distributed by the Endo Products Company.

METHODS OF TESTING IN ALLERGY

Skin tests are one of the most valuable aids in studying the allergic child; however, we have found them of little help in the child under twelve months of age.

In general, one could say they have an efficiency for foods between 30 and 40 per cent, and for environmental factors and pollens of nearly 90 per cent. These figures depend on activity of testing substances, site of application, and the investigator.

Scratch testing should always be the first procedure to insure safety and avoidance of systematic reactions, but intradermal testing should then be used on all scratch negatives.

The number of tests to be applied will depend on age of patient and symptoms. Past the infant age it is a good plan to test for foods, pollens, and environmental factors.

Usually we first apply ten tests in parallel rows, and then wait 10 or 15 minutes and read. Delayed readings are made 24 hours later.

In doing intradermal testing one should always test for cottonseed last since it occasionally causes a heavy reaction. Under no circumstances should fish oils or glues be tested intradermally, and, remember, spinach frequently gives a positive reaction. The citrus fruit group and strawberry, because of their low protein content, rarely give a positive response.

The question of how many proteins should be used in testing a child is often asked. For the child under 3 the food tests can be limited, but past this age we do the same group as is used in the adult. The epidermal group is the same in either child or adult. The pollens are in keeping with time of symptoms and place of residence.

A simple rule to remember is that the trees pollinate in the spring of the year, grasses during the summer, and weeds during the fall.

Child psychology is challenged in doing allergic work. In testing, we always first test on the arm in order that the child will appreciate the procedure. Some children develop much anxiety and true fear during testing. Theoretically, we have often wondered if this squirming child at such times could be producing epinephrine in excess and so influencing the skin test results.

Other tests, such as the ophthalmic, the nasal membrane, and passive transfer tests of Prausnitz-Kustner are of little use in pediatric allergy, except for the latter in studying a severe eczema.

Drugs for the Asthmatic Child

Wet Sleepers. In taking the history of an allergic child, I always make special inquiry about the degree the child perspires while sleeping. The type classified as the "wet sleeper" is the one whose forehead is beaded shortly after retiring and whose pajama neck is wet. At times the perspiration may be of such degree that one may wonder about nutritional imbalance or evidence of disease. It is this type of child who tolerates ephedrine poorly, and may present the chain of symptoms, such as irritability, headache, vomiting, and insomnia. I prefer Propadrine Hydrochloride for the "wet sleeper" since its action is mainly peripheral and does not have the cortical feature which is so often seen after the use of ephedrine.

I do not wish to convey the impression that the above is to be taken dogmatically, but, clinically, the simple division of children into the groups of the "wet" and "dry" sleepers has been a practical guide in the prescribing of ephedrine and epinephrine. I believe this excessive perspiration signifies an imbalance between the two nervous systems.

Epinephrine (adrenalin). Of all the drugs employed in the treatment of allergic conditions, epinephrine 1:1000 is without question the most valuable. This drug is the asthmatic's best friend, and emphatically, is not habit forming. In times past it has been used only in the final stages of asthma and frequently administered in too large quantities. It is of little value in hay fever, except in the treatment of constitutional reactions. Also, it is of some value in urticaria (hives) and angioneurotic edema (deep hives), particularly in acute cases.

Kinds of epinephrine (adrenalin):

(a) Epinephrine 1:1000 (Lederle, Winthrop, and Parke Davis). Dosage: Children from 1 to 5 years, 2 to 3 minims. Children from 5 to 10 years, give 3 to 5 minims. The second injection may be repeated in 20 minutes, and the third injection may be given two or three hours from the first.

(b) Epinephrine in oil 1:500: (peanut oil—Parke Davis; sesame oil—Winthrop). Dosage: 1/3, 1/2, and 1 cc.—action prolonged.

(c) Epinephrine 1:100 inhalation: Of little value in children under 6 years of age. All patients should be instructed to rinse mouth after using inhalation to minimize throat dryness and gastric distress. One of the best nebulizers is made by the Vaponefrin Company.

Aminophylline (theophylline ethylenediamine):

1. Very good for children who have become "epinephrine fast."
2. Dosage for intravenous administration is from 0.24 to 0.48 gm. (3¾ to 7½ grains) in 10 cc. or 20 cc. of distilled water or glucose. Inject slowly through a 26 gauge needle.

Aminophylline's best effect is when it is given intravenously. It comes in two strengths: 3½ and 7¾ grains, in 10 cc. and 20 cc. of saline. Always give aminophylline very slowly and allow ten minutes for administration. Reaction, such as a feeling of heat, a burning in the eyes, a sense of constriction in the chest, nausea, vomiting, and, at times, convulsions and coma may occur. Also, the solution may sclerose veins or cause excruciating pain should aminophylline get under the skin. Aminophylline by mouth is reported by some to have merit. Searle makes an excellent preparation.

Ephedrine sulfate of hydrochloride: The usual dosage is 0.015 to 0.03 gm. (¼ to ½ grain). In many cases phenobarbital must be included to minimize nervousness. Many children cannot tolerate ephedrine.

Emetics. Attack may be terminated by giving 1 to 2 teaspoonfuls of ipecac. If this fails to relieve, then apomorphine hydrochloride in doses of .003 grms. (1/20 grain) may be given hypodermically. Although advocated by some, I have seldom had to use this procedure.

Fluids. Hot sweetened liquids should be pushed to prevent an easily induced acidosis. If vomiting is present, glucose by vein will serve usefully. Salt is restricted.

Atropine can be used in attacks but is rarely of value. It should not be given in the presence of an intercurrent infection. Its effect being one of drying frequently defeats our problem.

Gases. Oxygen is usually effective in combatting anoxia. Masks or nasal catheters are preferred to tent units since they allow no nitrogen accumulation. In some oxygen 20 per cent plus helium 80 per cent is preferred.

Iodides. Various preparations of iodides have been recommended. It is difficult to excel plain potassium iodide or syrup of hydriodic acid.

Special Tablets by Mouth:

1. Propadrine Hydrochloride, ⅜ grain, is ideal for children who cannot tolerate ephedrine. For older children, ¾ grain.

2. Amodrine by Searle is excellent. Small children, ½ tablet.
3. Arlcaps by Arlington (grains 3 and 5) are excellent, but remember they contain aspirin, if the patient has an aspirin intolerance. Grains 3 is for children and grains 5 is for adults.
4. Ephedrine preparations are satisfactory, providing side effects are minimal.
5. Neo-Synephrin by mouth has little merit, in my opinion.
6. Tedral is excellent but ephedrine content affects some children.
7. Amesec by Lilly is also excellent, but remember it contains ephedrine.
8. Padrophyll contains both propadrine hydrochloride and theophyllin. Splendid for asthma.
9. Hydrallin (Searle), Aminophyllin and Benadryl are excellent.

The Anti-Histamine Drugs. Pyribenzamine and Benadryl[15] definitely relieve symptoms in urticaria, hay fever, and pruritus, but they have little effect in asthma. In fact, both have been a true disappointment when used in asthma. Their action is atropine-like, and this is the opposite effect desired.

Chemotherapy. Recently, certain cases of asthma, and particularly those of an infectional premise, have been benefited by the giving of sulfanilamide, sulfapyridine, sulfadiazine, and sulfathiazole. Before using any of these, make sure that a total blood study and urine examination have been made and repeated every 48 hours during the drug administration. In the event of toxic manifestations, the drug should be stopped immediately. And now, or most recently, is penicillin for asthma due to infection.

Morphine. One is nearly justified in making the dogmatic statement that this drug should never be used in asthma. Its danger lies in the fact that it knocks out the cough reflex and these patients drown in their own secretions. On rare occasions exhaustion of the patient may, seemingly, justify morphine, and if it is used, the dosage should be very small. Morphine should never be used in children. Demerol is effective because it is antispasmodic and gives sedation without respiratory depression. The dose is 1.5 mg. per kilogram of body weight.

Miscellaneous. 1. Occasionally a mixture of equal parts of ether and olive oil is effective as an enema, in amounts varying from 60 to 120 cc. — and make sure that the buttocks are vaselinized to avoid burning.

2. Iodized oil procedure is passé. Its use is limited to but very few cases, and in a large series of cases, it was responsible for many deaths.[17]

3. X-ray Therapy. There are a few cases where this has merit, but at present, it has been overpopularized by some.

4. Calcium preparations by mouth, and in the vein, have been disappointing.

5. Histamine and histaminase are now under critical review.

6. Vaccine therapy has merit in certain selected cases. I have seen no advantage of autogenous vaccine over a good stock vaccine.

7. Ethylene disulfonate: Present newspaper articles have heralded ethylene disulfonate as the wonder drug for 1944. Dr. Chauncey Leake, professor of pharmacology, and dean of the University of Texas Medical School, reports it has been an old story in California for years. From a scientific point of view, the claims of Spicer, its originator, could not be duplicated. And, as predicted by one of our members, it will eventually rest in the limbo of forgotten therapeutic agents.

8. Hapamine has been responsible for some severe reactions. If it later proves to have any value, it will be most limited. When given to six known cases of true ragweed it failed in each.

9. Vitamin C to the allergic patient has proved of no value.

10. Latest approach: Dr. A. V. Stoesser of the University of Minnesota successfully used pitressin and a low salt diet in some cases which failed to respond to the routine management.

Special Comments. In using any drug, first, individualize your patient; make sure that the diet is well balanced in calories and vitamins. Next, evaluate food factors, infection and psychogenic components.

Rectal Suppositories for the Asthmatic

Various companies now have such available in the adult and juvenile sizes, they being: Aminet by Bischoff, Tedral suppositories by Maltine Company, Theophylline by Upjohn, Theamin by Lilly, and Supposicone by Searle. Remember that Supposicone is not to be placed in the refrigerator, while all the rest should be. When a suppository is not available, one can take 10 cc. of the regular aminophylline vial and to this add 2 ounces of water and give as a "rectal cocktail."

Immunological Measures

There is a definite group of asthmatic children whose symptoms date specifically to a severe respiratory infection of exanthem. This group, according to Bray,[10] is called the "lung-damage type." Therefore, to minimize the incidence of this class, we urge that all children be immunized against pertussis between 5 and 6 months of age; for diphtheria, between 6 and 8 months, and smallpox vaccination at 12 months. Horse serum allergies can be excluded further if tetanus toxoid is given to the runabout child.

Measles can easily be prevented or modified by giving the convalescent serum of whole blood intramuscularly. The placental extracts advocated in measles immunity have been responsible in our experience for two very severe cases of hives. Gamma globulin is the ideal immunological agent.

We do not attempt to immunize our children actively against scarlet fever.

Diphtheria immunization may be improved if we do as Kern[11] suggests. In the cases which fail to give a negative Schick he then administers 1/10 of the usual subcutaneous dose intracutaneously.

In giving any convalescent serums or blood transfusions, always use the parent on whose side there is no allergy. Before administering serum always make careful inquiry about allergy.

Smallpox vaccination products are fast changing. A few years ago Eli Lilly and Company placed on the market S. V. Vaccine, prepared from the egg (chorio-alantoic membrane). The question was raised as to whether one could safely vaccinate a known egg-sensitive child with such a vaccine. To prove its efficacy, we selected five children who could not handle egg in any form. These children were scratch and patch tested and then vaccinated. Four had successful takes, and not one showed an unusual reaction. It can then be concluded that the smallpox-materials can be used routinely in vaccinating egg-sensitive children.

Special investigation has been done by Dr. Powell[12] showing that S. V. Vaccine contains some egg protein, but from a practical point of view, it can be ignored.

Vaccines. Vaccine therapy may have a definite place for certain asthmatic children.

To this group belongs the child who rarely has asthma unless he has an upper respiratory infection. These children are frequently troubled during rainy periods or when there is a sudden change in barometric conditions.

Both the stock and the autogenous vaccines have been tried. As a routine, a good stock vaccine has been as satisfactory as the autogenous. At best, it is less than a 50 per cent procedure. Some advocate pertussis vaccine, but here again we believe we are not giving a specific antigen, but producing a foreign protein response.

Specific skin testing with vaccines has been disappointing. Many false reactions may occur due to the presence of phenol or peptone.

We usually start with 2 minims of vaccine and increase 1 minim every three or four days until strong local response is demonstrated. If this is too heavy, we drop back to optimum. In some cases which have had little resistance to infection we give 2 cc. of gamma globulin every three months. The A & B Virus has been tried, but this is made from egg and repeated use may provoke reactions.

Before placing faith in vaccines, be sure that foci of infection have been removed. Insist that every allergic child be afforded early and complete protection against infectious disease; also encourage their annual "booster" injections.

PSYCHOLOGICAL ASPECTS OF THE ASTHMATIC CHILD

A majority of the behavior problems of the asthmatic child can be explained on a physical basis. However, some are the results of an over-indulgent environment. Therefore, the correction of the problem is often as significant as the program of hyposensitization.

It is said by some that certain children dominate the home or school because they can bring on an attack of acute cough or a wheezing spell at will. However, I have never seen a child or an adult who could "use his asthma" for some purpose. In my clinical experience, I have not as yet observed an individual with such voluntary powers on his autonomic nervous system. A great number of this type are over-active, and some temperamental. These children should participate in the popular sports. However, they must be taught to enjoy the game for what it is worth and not cultivate the idea of competitive achievement and social prowess for frequently heavy play in the late afternoon will precipitate an attack of asthma or severe coughing. Some may have to be excused from routine physical education requirements.

The question is often raised: "Are allergic children superior mentally?" From observation, we believe this group presents some interesting extremes, but if taken as a class are no more than average.

Piness[13] has shown that the intelligence rating in the allergic child is no higher than in the non-allergic. The allergic group seems superior because an asthmatic child is forced to be an indoor type. So, instead of being outdoors with the gang, he has more intimate associations with adults and reflects, as a result, their attitudes and interests.

As stated by Richards,[14] these children represent the strain of a Mack truckload of teacher and parent ambitions and strivings thrust upon a Ford chassis of constitutional capacities.

Therefore, the successful management of the asthmatic child represents the early recognition of symptoms and good allergic control.

Last, but not least, remember we are treating a growing child and not *just a skin test report.*

Also, emphasize to these children that they are expected to follow the same principles of social responsibility for the rights and privileges of others as the non-allergic group.

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SCIENTIFIC PROGRAM
of the
95th ANNUAL MEETING OF THE MINNESOTA STATE MEDICAL ASSOCIATION
Minneapolis, Minnesota
June 7, 8 and 9, 1948

Something new and different this year for the Minnesota Meeting: A series of Clinico-Pathological conferences and panel discussions on subjects of vital importance to all physicians . . . plus section meetings for the members interested in specialties.

Monday, June 7

9 a.m.—Clinico-Pathological Conference: CARDIOVASCULAR-RENAL DISEASES. E. T. Bell, Minneapolis, and Ovid Otto Meyer, Madison, Wisconsin.

Section Meeting: SURGERY OF EMERGENCIES. A panel of Minnesota men with guest speaker, Michael L. Mason, Chicago (9 a.m. to Noon).

11 a.m.—Panel Discussion: EMBOLIC PHENOMENA AND THEIR TREATMENT. J. S. McCartney and H. O. McPheeters, Minneapolis, and N. W. Barker, Rochester.

2 p.m.—Panel Discussion: SURGERY OF INJURIES. E. T. Evans, B. A. Smith, Jr., N. K. Jensen, Minneapolis; W. P. Ritchie, St. Paul; H. H. Young, Rochester; and Michael Mason, Chicago.

Section Meeting: NORTH MIDWEST CHAPTER, AMERICAN COLLEGE OF CHEST PHYSICIANS. A panel of Minnesota Chest physicians, J. A. Myers, Thomas Lowry, W. B. Tucker, William Roemich, David Sharp, Robert Nord, Allen Good, Arthur Olson, E. P. K. Fenger, Karl Pfuetze, G. A. Hedberg, S. S. Cohen and Russell Frost, discussing "Dangers of Delay in Diagnosing Indeterminate Pulmonary Lesions," "Some Experiences with Streptomycin," "Nebulization Therapy," "Peripheral Lung Tumors."

4 p.m.—Russell D. Carman Memorial Lecture in Radiology: THE ROLE OF X-RAY PELVIMETRY IN OBSTETRICS, Paul Chesley Hodges, Chicago.

Tuesday, June 8

9 a.m.—Clinico-Pathological Conference: ACUTE ABDOMINAL PAIN. A. H. Wells, Duluth; Walter G. Maddock, Chicago.

Special Session: SYMPOSIUM ON RESEARCH PROBLEMS. A panel of Minnesota physicians discussing nine different topics of current interest: David State, John LaBree, Frank D. Mann, S. Faik, Howard Horns, A. H. Baggenstoss, Craig Borden, F. W. Hoffbauer, J. L. Bollman, John Grindlay, George Moore (9 a.m. to Noon).

11 a.m.—Panel Discussion: NUTRITION IN SURGERY. Albert Snell, Rochester; Walter G. Maddock, Chicago; R. L. Varco, Minneapolis.

2 p.m.—Panel Discussion: ANTIBIOTICS. Four Minnesota physicians discussing penicillin, streptomycin and other antibiotics and combined antibiotic-sulfonamide therapy: S. H. Boyer, Jr., W. E. Herrell, Karl Pfuetze, W. W. Spink.

2 p.m.—Section Meeting: MINNESOTA ACADEMY OF OPHTHALMOLOGY & OTOLARYNGOLOGY. Guest speaker: Dean McAllister Lierle, Iowa City, with B. T. Horton, Rochester.

4 p.m.—Northwest Pediatrics Society Lecture: ST. LOUIS ENCEPHALITIS, Russell J. Blattner, Houston, Texas.

Wednesday, June 9

9 a.m.—Clinico-Pathological Conference: UTERINE BLEEDING. J. L. McKelvey, Minneapolis; Erle Henriksen, Los Angeles.

11 a.m.—Arthur H. Sanford Lecture in Pathology: RHEUMATIC AND BACTERIAL ENDOCARDITIS, Benjamin J. Clawson, Minneapolis

2 p.m.—Public Meeting: AN UNFINISHED JOB. A thorough and frank discussion of health needs in Minnesota showing medicine's part and the interplay of other factors influencing health. Distinguished guest speakers: J. O. Christianson, D.Sc., St. Paul; Lloyd E. Harris, Rochester; Senator Joseph H. Ball; Robert L. Novy, Detroit, Michigan; and Morris Fishbein, Chicago.

Special Events

Twenty round table luncheons on such subjects as Common Skin Diseases, Pediatrics, the Nervous Patient, Radioactive Iodine, Pelvic Pain, etc., are planned for Tuesday and Wednesday (ten each day) at 12:15 p.m. at Hotel Radisson.

Scientific exhibits and demonstrations by medical and allied professional groups and individual physicians, at the Minneapolis Auditorium.

A series of clinics at several Minneapolis hospitals, conducted by members of the staffs, have been arranged for Tuesday and Wednesday mornings.

Scientific cinema, each film a postgraduate course in itself, will be shown before each morning and afternoon session and at intermissions at the Auditorium.

Hobby show. Physicians will have their first annual Hobby Show. All physicians invited to bring their basketry, button collections, stamps, carving and any other collections or crafts which they may have. At the Auditorium.

Common Endocrine Problems in Childhood

Richard B. Tudor, M.D.,* and H. H. Groskloss, M.D.**

Minneapolis, Minnesota

The child with a possible endocrine problem is not uncommon. Some of these problems are not strictly endocrine in nature but are deviations from the normal growth and development. There is also a smaller group of congenital anomalies, such as mongolism, the chondrodystrophies, etc., which is in some distant fashion related to endocrine dyscrasias.

Of 300 cases referred to the Children's Endocrine Clinic of the Boston Dispensary, 70 per cent were cases of obesity, undescended testes and delayed onset of puberty. The following table lists some of the reasons for which children are referred to an endocrine clinic.

1. Obesity
2. Cryptorchidism
3. Delayed onset of puberty
4. Congenital anomalies
5. Endocrine
    a. pituitary dwarfism
    b. cretinism
    c. hyperthyroidism
    d. hypothyroidism
    e. goiter
    f. amenorrhea and dysmenorrhea
    g. gigantism
    h. hypogonadal dwarfism
    i. diabetes insipidus
    j. Addison's disease

A short consideration of the more common endocrine and pseudo-endocrine problems follows.

Obesity

A common pseudo-endocrine problem confronting the pediatrician is the fat child. The distribution of fat in these children resembles that found in women and adult eunuchs. The male genitalia appear small because of the large amount of suprapubic fat. There is no delay in the onset of adolescence. These children are usually not sluggish mentally but may be physically. As a rule there are no thyroid abnormalities in the family background. The patient has no hypothyroid stigmata and his basal metabolism is within a normal range.

One of the most important aspects of treatment is to determine the mental outlook of the child. Many of these overweight children are overeating because of being rejected at home or at school. Hilda Bruch has shown that they show a definite retardation in social and emotional maturation. In the child's uneasiness and insecurity overeating is resorted to as a source of comfort and enjoyment. One or two conferences with the child and parents separately suffices in most instances to find the trouble and suggest new sources of satisfaction to the child. In some of these children a simple diet for the first two to three weeks helps them to readjust their habits.

Other forms of obesity which should be considered in differential diagnosis are (1) the true Fröhlich type. Its three outstanding signs are obesity, failure of genital growth and some disturbance of skeletal growth (it may occur in dwarfs, acromegalics or giants). Diabetes insipidus also may be present. The cause has usually been found to have been an injury to the brain in the region of the hypothalamus and infundibulum. (2) Laurence-Moon-Biedl syndrome, characterized by hypogenitalism, retinitis pigmentosa, mental deficiency, familial occurrence and some congenital skeletal anomaly, the most frequent being polydactylism and syndactylism. The abnormality usually found at autopsy is a great increase in the basophile cells of the anterior pituitary. (3) Hypothyroidism, which occasionally produces obesity, but its other stigmata of skin, teeth, hair and mental sluggishness are more reliable signs.

Cryptorchidism

Therapy by endocrine substances causes descent only of those testes that would have descended at the time of puberty without treatment. It is thought that glandular treatment is important for three reasons. (1) Since the testis cannot function except within the scrotum, the earlier it reaches its normal environment the greater the chance of normal spermatogenesis at puberty. (2) Glandular therapy makes it at least theoretically possible to determine at an early age whether some mechanical reason exists to prevent normal descent. (3) Even though hormone therapy is fruitless, it facilitates orchidopexy by enlarging the parts to be operated on. The material of choice in treating undescended testes is chorionic gonadotropin. The pituitary appears to produce at least two gonadotropic hormones which stimulate the testes. One is the follicle stimulating hormone which stimulates the seminiferous tubules in the testis and causes the development of graffian follicles in the ovary. The other is the corpus luteum hormone which stimulates the interstitial cells of the testis to produce male sex hormone and causes luteinization of the follicles in the ovary. The production of male sex hormones by the testis theoretically inhibits the gonadotropic function of the anterior lobe of the pituitary.

The dose of chorionic gonadotropin advocated by most writers is 12,000 international units administered over a period of about two months.

The optimum age for operating on the undescended testis is just before or at puberty, sometime before the fourteenth year.

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Delayed Onset of Puberty

Delayed onset of puberty is usually due to loss of proper stimulating effect of the anterior pituitary on the gonads, that is, secondary hypogonadism, and is seen commonly in males in whom both testes have remained in the abdominal cavity. The intra-abdominal testis may produce enough male sex hormone to cause the secondary sex characteristics to become almost normal but there is always some evidence of deficiency, such as lack of adequate development of muscles and hair, and spermatozoa are never produced. In these individuals the excretion of gonadotropins in the urine is usually depressed or absent. Stimulation therapy with gonadotropic material should be employed theoretically; however, both chorionic gonadotropin and testosterone are usually used. The treatment is started at the age at which puberty normally sets in, in order to avoid skeletal anomalies and to insure that the response may be maximum. Hypothyroidism may also delay the onset of puberty and should be considered when its other signs are also present (see section on hypothyroidism). As a reshuffle of the endocrines takes place at puberty, conservatism must be the rule in endocrine therapy at this phase of life and throughout adolescence.

In primary hypogonadism the testes may be defective because of injury, infection or removal. In these cases the excretion of gonadotropins in the urine is normal. Ideally, substitution therapy with male sex hormone should be used in treatment.

Treatment in this group is very unsatisfactory probably because of the crude materials which are available for use. With the wider use of methyl testosterone, a potent preparation, perhaps better results will be achieved.

Hypothyroidism

Three types of hypothyroidism are seen commonly in childhood; namely, cretinism, juvenile myxedema, and borderline hypothyroidism. They are all one and the same disorder modified according to the severity and the length of time during which the patient has been subjected to the deficiency.

The cretin's characteristic bulldog face, thick lips, large protruding tongue and pot belly with large umbilical hernia is familiar to all. The signs of delayed development are stunting in growth, retardation of osseous development, and mental retardation.

Juvenile myxedema starts after infancy and is rare. The face is dull, the skin dry, coarse and sallow, the lips are swollen, and the hair is coarse and scanty. There is usually some retardation in dentition and bone age.

The commonest type of thyroid deficiency in childhood is the mild or borderline hypothyroid. Shelton says that "there may be something in the history, the appearance of the skin, the temperature, the pulse, the hair, the stature, the posture, the teeth or the voice to initiate investigation." The laboratory diagnosis may be difficult. A basal metabolism on the average child is difficult enough so that the results are not reliable. Bone age continues to be the most objective evidence of the developmental status of the child; however, one should not use this as the sole diagnostic criterion for if the child has not had a thyroid deficiency for long, he will have a normal bone age. On the other hand, if he has had symptoms for a number of years, the bone age should be retarded two years or more. The blood serum cholesterol is not pathognomonic of hypothyroidism because values vary even in the classic case. Persistent high blood cholesterol values otherwise unaccounted for, at least over 220 mg. per cent, however, are very suggestive. It is also felt that the urinary creatine is an important and fairly reliable diagnostic test. Creatine excretion is very low or absent in the hypothyroid child. Talbot feels that the alkaline serum phosphatase in children with hypothyroidism tends to be abnormally low and that it is restored to normal by thyroid therapy. Another common finding is a decrease of serum protein-bound iodine.

Hypothyroid children with few exceptions respond promptly to oral thyroid. In the mild or borderline case the response is more subtle. The dose of thyroid should be determined by physical, osseous and mental growth and by the avoidance of severe toxic symptoms. Between ½ and 3 grains a day is an adequate range.

Hyperthyroidism

Hyperthyroidism occurs rarely before puberty. When it does occur, the symptoms and signs are essentially the same as in the hyperthyroid adult. Girls are affected three times more frequently than boys. Many advances have occurred in the treatment of hyperthyroidism in the last years as a result of the introduction of antithyroid drugs and radioactive iodine. Radioactive iodine has not come into general usage yet. Propylthiouracil is the antithyroid drug most commonly used today. Present information indicates that it acts on the thyroid by preventing the synthesis of stored iodide to an active protein-bound hormone. It produces few toxic reactions although the possibility of development of agranulocytosis should be always kept in mind. The drug has been used in two ways: (1) to treat the disease medically—the effective daily dose varies from 50 to 200 mg. over a period of three months to one year; (2) to prepare patients for operation—Bartells believes that proper preparation of the patient with propylthiouracil followed by thyroidectomy offers the best chance of restoration to health in the shortest period of time with minimal risk.

Dwarfism

In the investigation of most types of dwarfing a careful and comprehensive examination is in order. Anyone interested in a most complete classification of dwarfs should read the excellent article by K. Shelton. Certain types, such as achondroplasia and classical cretinism, are easily recognized but many growth deficiencies escape notice until the condition is far advanced. The only essential clinical signs of the pituitary dwarf are stunted growth and complete failure of sexual development if the onset of the condition is during the early period of childhood, or atrophy of the genitalia if these have developed before the onset of the condition. The pituitary dwarf usually grows normally for the first two or three years and there is then a sudden deceleration of growth. These individuals usually do not develop sexually as time for puberty approaches. In contrast, the true or primordial dwarf grows slowly all his life but develops normally at puberty and during adolescence so that finally he is a normal individual, except for size.

In the treatment of the various types of dwarfs, obviously nothing can be done for the true or primordial dwarf. The treatment of dwarfing due to congenital disturbances of the skeleton is also fruitless. There is furthermore no endocrine product indicated in the treatment of dwarfing due to congenital heart disease, renal rickets, etc. One should expect to get his best results in the treatment of dwarfing due to nutritional and endocrine disturbances.

Pituitary dwarfs are best treated with chorionic gonadotropin and testosterone. Chorionic gonadotropin effects growth by stimulating the interstitial cells of the testis to produce male sex hormone; however, chorionic gonadotropin has not given good results so far with these individuals. Male sex hormone alone has been used lately in the treatment of the pituitary dwarf with some success.

Male sex hormone, i. e., methyl testosterone, is a general growth stimulant. It affects not only the development of the skeleton, but also the development of the musculature and the secondary sex characteristics and in fact appears to influence all the cells in the body. Talbot has recently treated one pituitary dwarf and eight small children, small because of what he calls "malnutrition related to anorexia, secondary to emotional disturbances." He used doses of methyl testosterone between 20 and 30 mg. a day for periods of two to three months at a time with very satisfactory results. All the children began to grow at once and in some the growth continued after the medication was stopped. The pituitary dwarf was treated intermittently with the testosterone over a period of two years, and when it was finally stopped, he continued to show satisfactory progress in height, weight, and maturation.

DYSMENORRHEA

Ovulation and a nulliparous cervix are two essentials common to a state of primary dysmenorrhea. Although the correlation is far from significant, the presence of infection, unusual attitude of the uterus, endometrial or endocervical polyp, and chronic disease, constitutional or metabolic, should be ruled out. Psychologic preparation for the onset of the menarche is often a helpful procedure. Various patterns and amplitudes of uterine contractions have been observed in this condition. The treatment of primary dysmenorrhea should be, in order of importance—hygienic, psychotherapeutic, medicinal, endocrinologic, and surgical. Included in the promotion of normal hygiene should be exercises directed toward the correction of fascial contractions. Medicine should comprise premenstrual catharsis, mild analgesics and/or sedatives, and also, however variable the response, the various antispasmodics such as curare, Edrisol, deproteinated pancreatic extract, pavatrine, atropine sulfate and trasentin. Surgical approaches should be limited to dilatation of the cervix with insertion of a stem pessary, or, more severely, a dilatation followed by curettage.

The endocrine factors often tried are the gonadotropins, testosterone, insulin (in the underweight patient with accompanying primary hypo-ovarianism), progesterone, thyroid and estrogens. Of these hormones, the latter two are alone dependable. The administration of progestin, to include anhydrohydroxy-progesterone, has given most disappointing results. Although the association of genital hypoplasia with primary dysmenorrhea is far from constant, correction with estrogens should be attempted. The greatest merit of the use of estrogens is that of instituting a state of anovulation. Estrogen may be started on the second or third day of the flow and continued for twenty days. A dosage of from 45 to 70 mg. is usually required. There may be no fear of permanent infertility. When fertility is desired the steroid therapy may be made cyclic.

AMENORRHEA

Amenorrhea is another entity in which one must first direct his attention to constitutional, nutritional, metabolic, and endocrine disorders. Noteworthy are tuberculosis, anorexia nervosa, adreno-genital syndrome, hypopituitarism, the hypothalamic syndrome, hypopituitarism, hypothyroidism and ovarian agenesis. If no obvious cause is found, it is wise to wait and observe, especially until the ages of 18 or 19 years. Observation, because of the chance for significant genital involutionary changes, should not be entertained indefinitely. Spontaneous remissions are not uncommon.

In the study of every patient one should look for developmental or functional deficiencies. Studies should include a complete clinical work-up — basal metabolic rate, X-ray of the sella turcica, glucose tolerance, and if available, determinations of gonadotropins, estrogens, pregnandiol, and the 17-keto-steroids. Beclere suggests that in hyperhormonal amenorrhea one notes a well developed girl experiencing precocious puberty, normal breast and hair development and matured genitalia. The reverse picture is seen in those cases of hypohormonal amenorrhea. In the former the gonadotropins or estrogens are increased and he suggests giving 10 mg. of progestin once a month and await withdrawal bleeding. The latter conditions show low gonadotropins and estrogens and should be given 1 to 5 mg. of estrogen plus 10 mg. of progestin, in the lutial phase, monthly. Secondary amenorrhea is characterized by the findings of high gonadotropic and low estrogenic levels. In the adrenogenital syndrome, one notes hirsutism, impaired glucose tolerance curve, and increased 17-keto-steroids. The menstrual flow may be induced with the use of estrogens alone, estrogens combined with progestin (together or cyclically), progestin alone, or the combined equine and chorionic gonadotropins.

Any one of the following estrogenic schemes may be used:

Ethinyl estradiol, 0.05 to 0.1 mg. daily for twenty days. Begin again in five days in the absence of bleeding, or on the fifth day after the onset of withdrawal bleeding.

Dienestrol or stilbestrol in 1 mg. doses, or Premarin (1.25 mg.) may be similarly used.

High dosage progestin, as suggested by Rakoff et al., is most effective. 20 mg. may be given daily for three doses.

Pregneninolone (anhydrohydroxy-progesterone), 5 to 15 mg., may be given in monthly cyclic fashion. This scheme is not indicated for primary amenorrhea, or for cycles of amenorrhea of more than six months' duration.

High dosage equine and chorionic gonadotropin therapy is also helpful. 1500 u. of equine are given daily for five doses followed by 1500 u. of the chorionic every other day for three doses.

Synapoidin is especially efficacious in Fröhlich's type of hypopituitarism. One must be on guard for gonadotoxic effects on the ovary (polycystic disease), the induction of antigonadotropic factors and for sensitivity. Significant rest periods should be allowed.

Following the period of withdrawal bleeding induced by any of the above states, routine cyclic steroid therapy is usually successful. After a period of three to six months, normally occurring menstrual cycles may be expected.

Gigantism

Gigantism is usually caused by an acidophilic adenoma of the anterior lobe of the pituitary. If the tumor is present before the epiphyses are united the bones grow more or less uniformly and gigantism results, but if the epiphyses have already closed when the process develops, growth is thereby modified and acromegaly develops. In some cases no real tumor can be found, but it is believed that there is always an increase in the number of eosinophile cells in the anterior lobe.

As a rule in gigantism the excessive growth begins about the age of puberty. The development of the genital organs may be retarded and the growth of hair over the body is scanty. Later in life the signs of acromegaly may be grafted on those of gigantism.

There is no satisfactory treatment; however, a series of deep X-ray treatments to the sella turcica is usually advised. The use of methyl testosterone to inhibit the growth factor present in the anterior pituitary has also been suggested but as yet no reliable reports of its efficacy have been published.

Precocious Puberty

Precocious puberty may be caused by tumors and hyperplasias of several endocrine glands and by damage to the brain itself such as occurs in encephalitis or hydrocephalus. The most common causes are (1) granulosa cell tumor of the ovary, (2) interstitial cell tumor of the testis, (3) adrenal cortical tumor or adrenal cortical hyperplasia, (4) pinealoma and (5) damage to the brain in the region of the hypothalamus, such as might follow in encephalitis or hydrocephalus.

Diabetes Insipidus

Diabetes insipidus is usually caused by lesions in the anterior group of nuclei of the hypothalamus. These nuclei are said to send fibres to the posterior lobe of the pituitary.

Among the common causes are tumors, basilar meningitis, trauma, epidemic encephalitis, tuberculosis and Schüller-Christian's disease.

Extract of posterior lobe of the pituitary in a powdered form insufflated into the nose several times a day gives good symptomatic relief. The usual dose of the posterior pituitary extract is 40 to 50 mg. three times a day.

Addison's Disease

The classical symptoms and signs of Addison's disease in children are the same as in adults. Children, also, often display an abnormal craving for salt. In the last case seen, the prolonged persistence of suntan throughout the winter months was the first abnormality noted.

The aim of therapy should be to overcome weakness, anorexia, digestive disturbances, abnormal loss of sodium chloride and water, retention of potassium and regulation of unbalanced carbohydrate and protein metabolism.

Four methods of treatment are available.

1. The diet should be high in carbohydrate, protein, and vitamins B and C. The potassium intake should not be restricted when desoxycorticosterone is used.

2. Sodium chloride in doses of 3 to 6 gm. a day should be given orally.

3. Adrenal cortical extracts provide the most complete type of replacement therapy and supply hormones that affect not only sodium chloride and water metabolism but carbohydrate and protein metabolism as well.

4. Desoxycorticosterone is used to prevent excessive excretion of sodium chloride and water and to promote excretion of potassium. Desoxycorticosterone is usually sufficient for the individual who is well maintained; however, adrenal cortical extract is essential during a crisis.

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HEALTH OF PRESCHOOL CHILDREN

The striking decline in the mortality among children of preschool age is an outstanding example of the recent progress in American public health. In the comparatively short period from 1930 to 1946, the death rate dropped more than 60 per cent among boys and girls 1 to 4 years of age insured in the Industrial Department of the Company (Weekly Premium Branch). For some of the individual causes of death, the reduction has been unbelievably large. The death rate from diarrhea and enteritis, for example, declined fully 90 per cent between 1930 and 1946 the mortality from the principal communicable diseases of childhood dropped virtually 80 per cent, and the rate from pneumonia nearly 75 per cent. In fact, almost all the major causes of death at ages 1 to 4 recorded large reductions. Accidents are the exception, the death rate from this cause declining 9 per cent among the boys and 19 per cent among the girls in the period under study. Pneumonia, which in 1930 was the leading cause of death by a very considerable margin, is now a poor second to accidents. Diarrhea and enteritis no longer rank among the leading causes of death at the preschool ages. A surprising development is the entry of cancer (including leukemia) into the picture as a leading cause of death, now ranking fifth among boys and fourth among girls at the preschool ages. This cause currently is responsible for one death in every 19 among children 1 to 4 years in this insurance experience.—*Statistical Bulletin*, Metropolitan Life Insurance Company, March, 1948.

The Normal Electrocardiograph in Children

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As there have been a great number of confusing reports and ideas as to the normal electrocardiograph in childhood, the authors wished to obtain as constant a standard for the various values and descriptions as possible. A brief preliminary report of a review of the literature of the last forty years on the normal electrocardiogram in childhood is presented. We have attempted to establish values that could be used as normals with the fewest exceptions possible. Over this period of years relatively little work has been done; however, the studies that have been made have been complete.

Inasmuch as the study of electrocardiography is the study of the direction, amplitude and time relations of a string galvanometer which reflects the electrical currents produced by the contraction of the heart, many variables will be introduced, dependent upon the size, location, and physical stresses and strains that affront the heart. The physical and physiological differences between the heart of an infant and that of an aged individual are apparent. At birth the infant has a high pulmonic pressure because he is suddenly called upon to breathe for himself. This is a reflection of his intra-uterine status which results in temporary overwork for the right side of the heart, so that approximately 80 per cent of infants show a right axis deviation. As time goes on, the blood pressure rises and the work of the left ventricle increases, so that there is a gradual shift from right to normal and then to left axis deviation.

The blood picture undergoes a great change between the newborn, the infant, the child and the adult. Due to the anoxemic existence of the fetus, the newborn is created with a high hemoglobin and red cell count; the fetal pulse is rapid in an attempt to get this relatively unsaturated blood through the system. These factors result in a rapid pulse during the period of early infancy which gradually quiets down as the tissues which started life as anaerobic structures take on the adult form of life as aerobic structures, and the heart consequently slows because of the lessened demand on the circulation and the increase in oxygen saturation. As the heart slows so all the components of the complex slow accordingly, and the infant gradually takes on the electrocardiographic picture of the adult. During this transition, however, there are very great variations from the adult figures, and variants are introduced which are irreconcilable with the simple difference between the heart of the newborn and that of the adult. Major physiological changes have taken place, so that the evaluation of mathematical figures for the direction, time relationships, and amplitude of the complexes of an instrument as sensitive as a string galvanometer must bear careful scrutiny to distinguish the normal from the abnormal. Therefore, we have taken upon ourselves the task of evaluating the normal in relation to the abnormal.

The Denver study of Burnett and Taylor,[8] and others, makes an excellent comparison of amplitudes, time relation and direction of the various components of the electrocardiogram in childhood. They have found that the mean values of electrocardiogram in the normal child are extremely constant, and the range of the normal within definite limits.

The chief deflection of the auricular complex is represented by the P wave and represents the flow of current from the sinus through the auricular muscle by a wave-like progression. It is a blunt, rounded deflection, usually smooth in contour but which may occasionally be peaked, with small notches on its ascending and descending limbs. In a child the notching is usually minimal. P_1 is uniformly larger than P_3. P_1 and P_2 are usually upright. P_3 may be positive, negative, or diphasic; but should not be positive, negative, and diphasic in the same strip of film, as this would imply an abnormal and variable course through the auricular musculature which would suggest disease.

Lincoln and Nicolson[10] found that P_3 was negative or diphasic in 10 per cent of their cases.

The height of the P wave in all leads varies between .05 and 2.5 mm. Ashman and Hull [1] found the average amplitude in lead 1 to be .7 and the range 0 to 1.5. In lead 2 the average 1.30 and the range from .5 to 2.5. In lead 3 the average .6, the range from .70 to 2 mm. The width of the P wave being .065 seconds with a range from .04 to .09. The P wave is followed by a short line that is either straight or dipped, due to the auricular T wave, which is not seen in the normal electrocardiogram but which may be seen in cases of complete heart block.

The QRS complex represents the spread of impulse through the a-v node, and the period of time during which the ventricles are activated. The complex should be smooth in its course, with a maximum of five transition points—the beginning of the QRS, the end of the QRS, and at three points where it reverses its direction. There should be no obvious slurring or notching of any of the limbs. It is normally upright in leads 1, 2, and 3, but it may be inverted, diphasic, with M or V contour, or polyphasic in lead 3. The amplitude of its limbs are variable, the upper limits of normal being 20 mm., the duration .09 seconds. R and T waves are always present, the Q and S are often absent. In the infant, large Q waves are normal, Q_3 being greater than Q_1 and Q_2. S is larger and decreases in size with age, and is most marked in lead 1. At birth and in early infancy the QRS complex may be small or inverted in lead 1. This inversion persists into the third and fourth month. It has occasionally been seen as late as the fourth or fifth year. The inversion of the QRS complex in lead 1 is due to the right axis preponderance of the infant's heart.

The T wave is a rounded or peaked deflection. It is usually upright but it may be inverted or diphasic in lead 3. Its height, duration, and width vary. Its limbs are asymmetrical, the end limb being straighter and shorter. In the limb leads there is normally no notching. The larger the amplitude of the T wave usually the greater its duration. The T wave is usually absent in the first week of life, T_2 becoming highest in the first three weeks of life, T_3 being low and frequently inverted. T_1 is greater in height in children than in adults. T_2 is equal in height, and T_3 is lower than in adults. The amplitude decreases with age.

Hafkesbring, Drawe, and Ashman[7] in a series of 100 normal children found T_3 was inverted in 38 per cent, and diphasic in 7 per cent. Burnett and Taylor[8] found T_3 inverted in 18.9 per cent.

The P-R interval is that portion of the electrocardiogram from the beginning of the P wave to the beginning of the QRS complex. It represents the time required for the impulse to travel from the sinus node to the ventricles. The largest measurement in the limb leads is the one to be used. The P-R interval should not exceed the average figure for the age by more than .02 seconds when the rate is rapid, and .04 when the rate is slow. The interval varies inversely to the heart rate—the more rapid the rate the shorter the interval. The P-R interval in children is actually shorter even when allowance for the increased heart rate has been made.

The RST segment is that portion of the electrocardiogram from the termination of the QRS complex to the beginning of the T wave. In children it is often absent, T arising directly from the QRS complex. The S-T segment may slope up or down but the takeoff should not be more than 1 mm. above or below the isoelectric level. It may be level or have a downward bowing in lead 3. Its duration is not significant. Its amplitude varies from minus ¾ to plus 1 mm.

The S-T or Q-T interval, or electrical systole, is shorter in duration in a child because of the more rapid heart rate. It represents the interval of electrical activity of the ventricles. It is definitely a function of the heart rate. The S-T lengthens with age as the heart rate decreases with age.

In discussion of the chest leads, the auricular T and the U waves have been omitted in an effort to simplify the descriptions as much as possible. We have concluded from the studies of these many authors that the mean averages of the amplitudes, time relations and directions of the various components of the normal electrocardiogram in childhood are constant but that the span of possible normals is great.

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PEDIATRIC NURSING

The first attempt to define the kind and amount of nursing care, both physical and psychological, needed by children is reported in "A Study of Pediatric Nursing," published by the National League of Nursing Education. The study, carried on at The New York Hospital and sponsored by the U. S. Children's Bureau and the League, recorded and evaluated all nursing activities, whether by registered professional nurses, student nurses, or trained practical nurses.

For the first time, a list of ten basic psychological components in good pediatric nursing care was drawn up as a measuring rod. Records showed that far more time and attention were given by all types of nursing personnel to physical than to psychological factors and that the level of performance was better in the former.

"A Study of Pediatric Nursing," may be ordered from the National League of Nursing Education, 1790 Broadway, New York 19, N. Y., 112 pp., price $1.50.

A Preliminary Report on the Association of Growth Failure and Poliomyelitis*

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Among the most important questions about poliomyelitis are those which have to do with susceptibility to this disease. Like many of the questions pertaining to the virus itself, to its transmission, and to the environment that harbors it, the matter of host susceptibility has been studied for the most part by immunological methods.

With all due consideration, however, for the epidemiological and immunological facts that have been made known, the peculiarities which poliomyelitis shows in its occurrence, spread, and distribution still leave much to be answered on the question of individual susceptibility. For instance, it has not become possible, as in the case of diphtheria, to determine individual susceptibility in any practical way. Thus, in spite of the obvious viral origin of the disease, its occurrence in any given child is largely unexplained—for presumably equal exposure has rarely led to equal incidence or attack. Our interest in this problem has been along a different avenue, for we have tried to ascertain whether the growth of children and, in particular, whether *growth failure* has any bearing on the incidence of poliomyelitis.

To bring out the intent and meaning of this approach as concretely as possible, a few preliminary statements of explanation may be made. Heretofore, the question of susceptibility has been approached from the standpoint of investigating certain organ systems, body fluids, or the excreta. On the other hand, what the child himself represents, as a functioning whole, has been either disregarded or taken for granted. There have, of course, been some earlier attempts to determine the role of particular nutritional elements, such as thiamin,[1] and some anthropological studies on physical traits of eyes, eyelashes, teeth, palate and joints.[2] But again, these are examples of piece-by piece inquiry, as contrasted with the idea and purpose of determining whether susceptibility is influenced by the physical condition of the whole child. The purpose of our study was to determine if there is anything about the child himself that ever decides the issue—after the virus has invaded, or is about to invade—whether that invasion will eventuate in a clinical attack. For this purpose, nothing comes closer to representing the operational physical condition of a child than the character of his over-all growth. Our approach, therefore, was one in which we wished to determine whether good or poor growth had any corresponding influence on individual susceptibility.

In recent years a number of methods of graphic analysis have become available for the more careful study of this critical relationship of growth and susceptibility to disease. The one which we selected for comparison of growth characteristics of groups of well and ill children is the Wetzel "Grid for Evaluating Physical Fitness." By plotting a child's weight and height at successive ages on a Grid, two curves are obtained, the one in the channel system showing the direction, the other, on the right, showing the speed of physical growth and development. Satisfactory and unsatisfactory growth are thus determined by noting how well these curves parallel the Grid standards of direction and speed. One looks especially for the change of direction that indicates loss of physique, and for "slow-down" in an auxodrone. In addition, one may also classify children in terms of body size and body build by means of "levels" and channels respectively.

The comprehensive picture which one thus obtains from a child's Grid record of development may be analyzed in many ways; a full description is beyond the scope of this paper. What is chiefly important is that the Grid technique does provide a very simple method of classifying groups of children accurately on an over-all basis of good or poor individual growth, and according to definite objective rules and criteria.

Methods and Clinical Material

For many purposes it would have been sufficient to limit this study simply to children with poliomyelitis. It was considered important, however, to check the observations in the patient group against similar data in two additional groups of siblings and classmates of the patients. Among the 856 children included in the present study, 133 were patients with poliomyelitis (75 boys, 58 girls in the 1946 epidemic), 104 were siblings, and 619 were classmate controls of the same age and sex, in a ratio of about five to one. Practically all of the subjects attended the public or parochial schools of St. Paul, Minnesota, and all were between 5 and 18 years of age.

The basic data consisted (1) of weight-height records previous to 1947 as kept by the school nurses on individual health cards, and (2) of weight and height measurements made during April and May of 1947. All data available for any given child were utilized in order to make each Grid as complete as possible. In very few instances were observations limited to one or two values before the child contracted poliomyelitis. All Grid records were checked independently by three different observers for correct plotting and evaluation. Dr. Norman C. Wetzel was consulted in the interpretation of the Grids. These Grid records were then classified and ana-

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lyzed to determine, among other things, (1) Age and Level incidence, (2) Whether any body build or physique type predominated in the patients as compared with the controls, but above all, (3) Whether poliomyelitis appeared equally in the children manifesting satisfactory or unsatisfactory growth, or, if not, what the nature of any other distribution might be.

Results

Age and Level Incidence. As in other recent series, the majority (82 133) or 62 per cent of our patients were between 5 and 10 years old, the greatest number at any age being 21 at 6 years. But this is purely incidental, since age itself is incidental to the more vital matter of physical progress as calibrated in this graphic system.

What we regard as distinctly important is that our series shows a piling up of patients in two level regions: (1) in a lower region between levels 0 and 80, where 73 cases (55 per cent) appeared, and (2) in an upper region beyond level 140, where 37 cases (28 per cent) appeared. Between these is a gap from level 70 to 140 which is strikingly free from polio patients. Since this gap coincides with the pre-pubertal stage of development, the comparative scarcity of cases within it would suggest that susceptibility is somehow lessened at this stage of development.

Obviously the finding of this gap suggests some interesting leads for further research, and subsequent investigation is required to determine their full significance.

Physique Relations. The percentage distribution of our three groups with regard to various channel combinations of physique or body build is given in Table 1. As an additional basis of comparison, the corresponding values reported by Wetzel on a group of 2,095 children at level 100 are also given. The results show a smaller proportion of polio patients among the stocky body types, and a correspondingly greater share below channel A_1. Actually, 93 per cent of the patients were in A_1 or below, whereas only 85 per cent of the other groups appear in the same lower channels. In this series, accordingly, poliomyelitis was slightly more frequent in the children of medium and linear body types than in those of stocky build. This shift is statistically significant, but would be inevident clinically without graphic study of height-weight data. It was found on further study of these children that this slight difference in physique was but an expression of growth failure occurring previous to the poliomyelitis epidemic. It was thus shown that this was not due to genetic influences.

Satisfactory, Unsatisfactory and Questionable Growth. In addition to children with obviously satisfactory Grid records, and those whose growth is definitely unsatisfactory, there were encountered a few examples whose growth, though not good enough to be called satisfactory, is, nevertheless, not bad enough, on the basis of available evidence, to be counted as unsatisfactory. It is useful, in practical work, to combine these questionable examples with the unsatisfactory group to form a broader category of "screened" subjects. On this basis, the whole series of 856 cases yields the results given in Table 2, wherein the proportions of "satisfactory" and "screened" subjects among the sibling and classmate controls is almost identical.

Table 1

Physique Distribution — Per Cent

Channel	A_4 and above	A_3-A_2	A_1-B_1	B_2 and below	No. of Cases
Wetzel's Standard Series	7	9	62	22	2,095
Classmate controls	3	11	65	21	619
Siblings	3	12	62	24	104
PATIENTS	4	3	68	25	133

Table 2

Screening of Patients, Siblings, and Classmate Controls

	Satisfactory	Screened*	Total
Classmate Controls	494	125	619
Siblings	82	22	104
PATIENTS	45	88	133
	621	235	856

* Unsatisfactory plus Questionable.

Table 3

Screening of All Controls and Patients

	Satisfactory	Screened*	Total
All Controls	576	147	723
POLIO PATIENTS	45	88	133
	621	235	856

* Unsatisfactory plus Questionable.

Table 4

Actual Compared with Expected Number of Growth Failures among 133 Polio Patients

	Satisfactory	Screened	Total
Observed	45	88	133
Expected (1/3 basis):	89	44	133

Table 5

Actual and Expected Number of Growth Failures among 95 Polio Patients with Either Definitely Good or Definitely Poor Growth

	Satisfactory	Unsatisfactory	Total
Observed	45	50	95
Expected (1/3 basis):	63	32	95

Consequently, these comparison groups may be combined, with some simplification, into a single control group, as in Table 3, from which it is evident that only 33 per cent of the patients showed good growth, whereas fully 80 per cent of the controls did so. On statistical analysis, it was found that the probability of such a difference being due to chance is less than 1 in 10 million. The conclusion is that poliomyelitis and poor or questionable growth are definitely associated phenomena in this series.

The same conclusion can be reached in a slightly different way. It is commonly found that between 25 and

33 per cent of a given group of children in the general population will be found below the Grid requirements for good growth. Our control groups (siblings and classmates) demonstrated a relatively low incidence (20 per cent) of failures. It was found, however, that 88 of the 133 patients with poliomyelitis showed poor or unsatisfactory growth by Grid criteria (Table 4.) Here again the probability is exceedingly small that these results could be due to chance. Instead, they confirm the fact that in this series poliomyelitis is definitely associated with questionable or unsatisfactory growth.

To eliminate any possible doubt that might arise from the fact that the "screened" cases contained a mixture of truly unsatisfactory and questionable records, a study of the 95 children who showed either definitely good, or definitely unsatisfactory growth, was also made. The results as given in Table 5 confirmed the above conclusions.

For practical purposes, the foregoing results mean that, other things being equal, susceptibility to poliomyelitis is increased by conditions which lead to unsatisfactory growth. In a very real sense, everything connected with poor growth may be viewed as a factor that predisposes toward attack. Even as limited as this study is, it allows no escape from the conclusion that, in the present series of children, poliomyelitis and poor or unsatisfactory growth are associated phenomena.

Remarks

The conclusion to which we thus come is the converse of common teachings. There has been a general impression among students of the problem that poor nutrition is not a predisposing element in poliomyelitis as the disease attacks children who seem, from uncalibrated clinical appearances, to be ostensibly well and of good physique.

In finding that poliomyelitis and unsatisfactory growth are definitely associated in this series, we are actually finding at the same time that poliomyelitis is also associated with whatever malnutrition accompanies growth failure. This result is not entirely at variance with the impression just referred to, because by using the Grid technique to evaluate growth we were able to identify early and slight losses of physique or slow-down in growth long before the full effects of these changes could possibly have become obvious to clinical inspection. These Grid signs—loss of physique and slow-down—characterize simple growth failure, and this in turn is always accompanied by a corresponding degree of simple malnutrition. It is, in fact, the latter form of malnutrition that Wetzel has called the "shadow of growth failure." It cannot be identified, at least not in its early stages, by common visual, chemical, or hematologic criteria, but only by recognizing that growth has failed to meet the graphic criteria of the Wetzel Grid.

To prevent misunderstanding on this point, we emphasize first, that it is unsatisfactory growth, not malnutrition *per se,* which we have found to be associated with poliomyelitis in our series; and second, that any accompanying malnutrition could be a determining factor only to the extent that it contributes to growth failure.

Finally, the practical importance of the present findings would seem to be plain for, whatever the causes which ultimately lead to growth failure, or whatever the mechanism whereby growth failure then leads to increased susceptibility to poliomyelitis, a program of identification and remedy of these causes of growth failure in children should take its place among other established procedures that are designed to prevent human poliomyelitis.

Summary an Conclusions

The past growth of a group of 133 children contracting poliomyelitis in the 1946 Minnesota epidemic was compared with contemporaneous growth of 104 siblings and 619 classmates by plotting age, height and weight data obtained from school records on the Wetzel Grid for Evaluating Physical Fitness. It was found that unsatisfactory growth preceded an attack of poliomyelitis in 66 per cent of the patients, as compared with its simultaneous appearance among only 20 per cent of the sibling and classmate controls. The likelihood of such a difference being due to chance is exceedingly small by the usual statistical criteria.

This association between growth failure and poliomyelitis helps to explain the further finding that the disease spared children of stocky build, and was slightly more prevalent than expected in those of medium and linear body types.

Attention is called to the comparative scarcity of patients between developmental levels 70 and 140 of the Grid, the pre-pubertal stage of development.

The implication of our findings is that, other things being equal, susceptibility to poliomyelitis is increased by conditions which lead to unsatisfactory growth, and that factors associated with poor growth predispose to poliomyelitis attack.

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PEDIATRICS FOR GENERAL PRACTITIONERS

The areal meeting of the American Academy of Pediatrics will be held at the Hotel Schroeder, Milwaukee, Wisconsin, June 28-30, 1948. Attendance is not limited to pediatricians, and all members of state medical societies in the area are invited. Registration fee, including a ticket to the banquet, is $10. Advance registrations may be made by writing Dr. C. G. Grulee, Secretary, American Academy of Pediatrics, 636 Church Street, Evanston, Illinois.

Peritonitis in the Newborn of Intra-uterine Origin

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Many years ago my interest in placental transmission of disease was stimulated by a case of joint involvement in a 6-day-old infant following an acute arthritis at the time of delivery in the mother.[1] More recently the question has been asked as to what initiates the process that results in anomaly and abnormality in utero. This case has many loopholes but it may remind us that disease in the mother during pregnancy is important.

This baby was born November 12, 1945, of a 36-year-old mother, the eighth pregnancy and the ninth baby. There had been one set of twins; two children had died, one of pneumonia at 1½ years of age, and one of the twins at 2½ years "due to heart." There had been no stillbirths or miscarriages. The mother was admitted on November 10, 1945, and discharged after X-rays, laboratory, and examination, to return two days later. She was having "slight pains at long intervals." The blood pressure was 106/88, pulse and respirations were normal, and the temperature was 98.6 to 99.4 by mouth. The urine was essentially negative: sp. gr. 1.010, pH 6, negative albumin and sugar, occasional RBC and 15 to 20 WBC. The microscopic findings were probably an accompaniment of late pregnancy. X-ray report of the abdomen showed "Single pregnancy near term with probably a moderate hydramnios; bilateral congenital hips; pelvis large and adequate."

The clinician estimated the date for delivery as December 8, 1945, and confirmed the polyhydramnios on examination. There was some question also as to wheththe fetal heart was audible. The history of the mother during this pregnancy was that she had been fairly comfortable, no headache or edema, and no disturbance of bowel function.

She gave, however, some information which may be of importance in understanding the events that followed in relation to the baby. Two weeks before this first admission she had what was epidemic in Minneapolis, and what was noticed in other members of her family, namely, "intestinal flu." This was characterized by diarrhea, nausea and vomiting in her case. One week later she reported that her abdomen increased in size. The baby was born about two weeks and two days after her illness, and about nine days after she noticed the increase in the size of her abdomen.

The baby was, therefore, according to menstrual history, one month premature. The obstetrician's description at birth was as follows: "Labor was very easy, one in which the baby was born rapidly in the same pain which ruptured the membranes. With the rupture of the membranes an excessive amount of fluid was expelled. The baby's cry was vigorous, and immediate condition appeared to be good." The birth weight was 6 pounds, 10¾ ounces.

At 24 hours of age, edema of the extremities and back was noticeable. The abdomen was distended and chest prominent. The cry was weak and intermittent, cyanosis was observed. The X-ray of the abdomen indicated an abnormal accumulation of fluid in the peritoneal cavity as well as considerable gas accumulation in the intestinal loops. The laboratory examination, routine blood smear on the first day, was negative for the presence of erythroblasts.

The child was seen in consultation by one of us on November 14 and the history recorded on this date was: "Baby was edematous at about 24 hours or sooner, the abdomen, legs, and back involved. No vomiting. The baby has taken from a few cubic centimeters to as much as 1½ oz. of cow's milk mixture from the bottle."

The examination showed a slightly jaundiced baby with an abdomen distended to the point of shininess. There was a pitting edema of the legs, abdomen, and over the sacrum. A catheter was introduced easily into the rectum, and normal food stool obtained. This, with the history of previous meconium stools, inclined us to discount obstruction of the bowel. Also, puffiness of the dorsum of hand and questionable thickening of the scalp was noted. There was less edema above the diaphragm than below.

It was surmised that the kidney was the organ involved and further laboratory procedures were done. The Rh factor was positive in the mother and the baby. This with the previous absence of erythroblasts made erythroblastosis with generalized edema very unlikely. The hemoglobin was 97 per cent on the basis of 16 grams = 100 per cent. Hypoproteinemia was suggested as a cause of edema, and the decision was made to take blood for chemistry and give 50 cc. of plasma by sagittal sinus the evening of November 14. The blood chemistry reported was 4.2 mg. per cent of total plasma protein, and urea nitrogen 17.7 mg. per cent. Urine examination was not impressive: very faint trace of albumin, pH of 5. and 2 to 5 pus cells in centrifuged specimen.

The hemoglobin was 81 per cent the next morning, November 15, and was interpreted as dilution due to intravenous plasma. The subcutaneous edema was definitely less but the abdomen was more distended. X-ray at this date, when the baby was three days of age, showed what appeared to be ascites and extreme distension of the small bowel. Obstruction of the bowel was diagnosed the afternoon of the fourth day. At the age of 3½ days an operation was done in the evening. Vomiting had taken place the previous 24 hours.

The report of Dr. O. S. Wyatt, the surgeon, is, in part, as follows:

"Upon opening the peritoneum, a large amount of straw-colored fluid exuded from the abdominal cavity.

The distended small (bowel) was removed from the abdomen and explored, and was found to be adherent to other loops of bowel, with the root of the mesentery being edematous, and with a large amount of exudate present over all the intestinal surface. There were three loops of small bowel adherent to the liver surface, and in separating the bowel from the liver surface, a perforation was made in this gangrenous bowel. From the appearance of the bowel it was felt that the loop which had been involved in the segmental volvulus was not viable. About 10 inches of terminal ileum and a portion of the cecum was resected. (Note: the latter was removed so as to facilitate end-to-end anastomosis. The small bowel was involved to within several inches of the ileocecal valve.) The large bowel, which was about the diameter of a cigarette, gave the appearance of never having been distended, and by the appearance of the bowel we felt that a primary peritonitis was present in this child in utero, giving rise to the destructive symptoms which we encountered. Penicillin (100,000 units) was instilled into the peritoneal cavity. (The anastomosis between dilated small bowel and collapsed large bowel was most difficult.)"

After operation, the child's condition was good and continued so for 24 hours. Intravenous blood, plasma, and penicillin were given. At 24 hours postoperative, the temperature, which had been 101° F., rectal, rose to almost 104° F., and the pulse, which had been easily palpable at the wrist, became very fast and difficult to palpate. Distension of the abdomen necessitated Wangensteen suction, and the child steadily became worse, dying on November 18, at the age of 6 days, or 2½ days after surgery.

An autopsy was done 25 hours after death by Dr. R. W. Koucky, whose report follows: "The body is that of a male infant weighing about 2700 grams. The abdomen is very prominent. The body appears to be malnourished, and extremities are small and thin. (Edema was present postoperative, however.) The peritoneal cavity shows an encapsulated abscess containing air, lying anterior to the stomach and liver, and extending into the left subphrenic space. The remainder of the peritoneal cavity is obliterated by light fibrous exudate with occasional small accumulations of purulent fluid between loops.

"The pleural cavities and the pericardial sac show a slight excess of clear fluid. The mediastinum is edematous. The structures appear congested. The heart shows no congenital anomaly and no hypertrophy. The lungs show patches of atelectasis in the posterior portions. There is no obvious bronchopneumonia. The spleen weighs about 7 grams and shows no gross change. The liver weighs about 85 grams. It is somewhat deformed by the pressure of the abscess. The internal structure of the liver shows no infection or abscess, and the portal vein no thrombosis. The edge of the liver adjacent to the gallbladder shows a laceration of the capsule opposite the operative site.

"The esophagus and stomach show no definite change. The small bowel shows a plastic peritonitis and is generally dilated. There is an anastomosis between the ileum and beginning of the transverse colon. The posterior two-thirds adjacent to the mesentery is intact. On the antimesenteric portion there is necrosis and the internal gut can be expressed through the anastomosis. The distal part of the colon is small but shows no change. It contains a small amount of fecal material.

"The pancreas and adrenals show no hemorrhage or malformation. The kidneys are smooth. The pelves are not dilated nor injected. The bladder shows no cystitis. A section of the loop of bowel, removed at operation, showed a fibrosis with polymorphonuclear and monocystic infiltration, and a widespread growth of young blood vessels. This is present both on peritoneum and at the end of strangulated loop. The process is very definitely much older than the three or four-day clinical record (post-natal life) would indicate, and therefore it is the assumption the process began in utero."

DISCUSSION OF LITERATURE

There are many aspects to this case, but two merit special attention: (1) the pitting edema of legs, abdomen, and back, and the puffiness of dorsum of the hand and (2) the peritonitis.

Feer[2] described certain babies which are stillborn or die soon after birth due to fetal aseptic peritonitis. Death is due to adhesions of the bowel and strangulation. Occasionally such children survive and show symptoms of obstruction of the bowel. Other writers mention also aseptic peritonitis caused by rupture of the bowel and irritation of peritoneum by meconium. Fetal peritonitis, per Feer again, can follow anomalies of the intestine or genital apparatus, and/or perforation with peritoneal contamination or infection through the placenta. This last would seem most likely in our case. No meconium was seen in the abdomen, there was no obvious bowel defect, and no bleeding as indicated by vomiting, stool, or postmortem examination of the bowel. Feer continues: "In a percentage of the last (infection through placenta) syphilis is the cause and syphilitic peritonitis accompanies the rash."

Abt[3] makes the statement that "The effusion in fetal ascites is essentially the result of portal obstruction or chronic fetal peritonitis." Syphilis was thought to play an important role. Differentiation of ascites was: (1) those due to fetus independently of maternal influences, and (2) those transmitted through the placenta. This latter was considered very briefly at this time.

J. W. Ballantyne[4] mentions a Guillaume Mauguest de la Motte (1655-1737) who "described cases of labor complicated by general dropsy, by ascites and by inflammatory peritoneal effusion in the fœtus . . . But of all writers on Midwifery, Francois Mauriceau (d 1719) was the one who in this century made the most valuable observations on morbid states of the fœtus. He, himself, was the subject of a fœtal disease, for his mother, whilst carrying him in her womb, was engaged in nursing his brother who died of small-pox, and although she did not contract the infection, Mauriceau was born covered with variola pustules."

Ballantyne also quotes E. Zurmeyer of Bonn, Germany, who in 1832 wrote a dissertation entitled "De Morbis Fœtus." Two quotations from Ballantyne about this book are interesting: "In the third Chapter he (Zurmeyer) devoted much space to the consideration of the inflammations, naming fœtal meningitis, pneumonia, pleurisy, pericarditis, esophagitis, nephritis, and peritonitis. In the 4th chapter, measles, smallpox, congenital pemphigus and syphilis were described." The diseases enumerated occasioned no comment by Ballantyne, so it would appear that all four were considered well established at the time—1892.

James Y. Simpson [5] wrote a treatise on "Peritonitis of the Fœtus in Utero," which is widely quoted. This is contained in a collection of his works edited by J. Watt Black,[6] and describes a case of twins, one healthy and one stillborn, with pericardial, pleural, and peritoneal effusions and adhesions between coils of bowel and parietal peritoneum. He describes no case similar to ours. All of his cases were stillborn or died wtihin 24 hours.

More recently, Lattes [7] reported a case of fetal meconium peritonitis. This baby had extreme ascites and enlargement of the abdomen in utero. Adhesions were present, and also a greenish, jelly-like mass, 2.0 x 1.5 cm. adherent to the outer wall of the terminal ileum opposite the mesentery, about 10 cm. from the ileocecal valve. The child only lived a few seconds. Apparently deep intestinal glands had been herniated into the serosa and peritoneum, and there produced a condition similar to pseudomyxoma peritoneii following the rupture of a mucocele of the appendix. The greenish color identified the meconium pushing through the perforation. Labor was difficult in this case because of the large abdomen. The photomicrographs certainly do not show the infiltration of cells—nor the blood vessel proliferation in our case.

Fischer [8] reports a case of diverticulum of the large bowel with rupture and leakage of meconium, and peritonitis, abdominal distension, ileus, and vomiting. The first symptoms were noted at birth. At operation at the age of 22 hours, the intestines were markedly distended, dark purple, covered with fibrinopurulent exudate. Culture of peritoneal fluid showed a growth of streptococci. A loop of small bowel was brought out of the wound and an enterostomy performed. The child lived three days. It seemed likely that secondary infection after birth played a role. This baby showed no generalized edema.

Boikan [9] reported a case of meconium peritonitis. Microscopically the deep intestinal glands in lymphoid tissue seems to have predisposed the bowel to rupture. Boikan states that in cases without intestinal obstruction, where meconium peritonitis occurs, perforation occurs two times as frequent in the colon as in the terminal ileum.

DISCUSSION

It, therefore, becomes increasingly obvious that the history and findings in this case are rather unique. There is a likelihood of the placental transmission to the peritoneum of the baby; that anomaly of the bowel was unlikely. No other anomalies were found. The bowel was patent for the first 24 hours. No hemorrhage was demonstrable to make one consider ulcer and perforation. No meconium in the ascitic fluid or in the peritoneal cavity to make "meconium aseptic peritonitis" an acceptable diagnosis. Negative history in the mother for previous involvement at birth of either incapacity or illness. "At 2½ years, one twin died of some heart ailment" with no diagnosis known and no details available. The mother had congenital hips.

Now as to possible etiology: In the literature, syphilis, smallpox, pneumonia and peritonitis have been mentioned previously. This means that though the placenta allows few invasions of the fetus, it rarely allows almost any micro-organism or virus to infect the fetus. Swan, et al., report no cases of associated fetal peritonitis though cataracts, deaf-mutism, cardiac disease and microcephaly in mothers having rubella in the first to the third months of pregnancy.

In toxoplasmosis, a protozoa goes through the placenta and causes brain involvement and hydrocephalus.[11]

In recent diarrhea of newborn, associated with so-called intestinal flu, the assumption has been made that this is also a virus disease. This means that in the case here reported a virus infection should be considered as a possible, even though not probable, etiology of peritonitis.

There remains to be considered the blood chemistry of total plasma proteins 4.2 grams per 100 cc. and blood urea nitrogen of 17.2 mg. per cent. The latter can be considered normal. The 4.2 plasma protein is quite low, but when we consider the fact that babies have low plasma proteins, the edema is not necessarily explained on this basis. The absorption from the peritonitis may have had toxic effects on the subcutaneous tissue, thereby holding the fluids. It seems unlikely that edema could have been due to either pressure under the liver by the involved bowel or the lowered blood protein. When one considers both factors, it may be possible. The peritonitis with exudate certainly could have lowered the blood proteins, or at least that is one of the things we anticipate with severe peritonitis in postnatal life. It would be wise to do more chemistry on these—ascitic fluids and exudates.

SUMMARY

A case is reported of a baby whose mother had seven normal pregnancies. Congenital anomaly of the heart may have been present in one, a twin that died at 2½ years. The mother had congenital hips. With the pregnancy in question she had so-called intestinal flu with nausea, vomiting and diarrhea. One week later, she had a noticeable enlargement of her abdomen. Two weeks later she had weak pains and hydramnios, although blood pressure, urine and other examinations were negative. Two weeks and two days after the vomiting diarrheal episode, she delivered an apparently normal child. This child in 24 hours had unmistakable pitting edema and, in 48 hours, abdominal distension. The intestinal tract,

which was patent at 48 hours, then became completely obstructed. The baby's and mother's Rh factor were positive. The hemoglobin was slightly lowered, total plasma proteins were low, but blood urea nitrogen was normal.

When the baby was 3½ days of age, an operation was performed for obstruction. A segment of the small bowel was considered non-viable and removed. This showed organization of exudate of long standing—a week or ten days or more.

There was no evidence of congenital anomaly, ucleration, diverticula of the bowel, or tumor; no evidence of kidney involvement, no meconium in the peritoneal cavity. Therefore, this case is reported as placental transmission of a bacteria or, in lieu of recent studies of diarrheal diseases in newborns and adults, possibly a virus fetal peritonitis. There seems to be no other explanation. No evidence has been brought forward that such diseases of the mother during pregnancy, as measles, German measles, mumps, toxoplasmosis, though they have caused involvement in many parts of the body, have ever caused peritonitis. Syphilis is ruled out by absence of enlargement of the spleen and liver, rash, and negative Wassermann, as well as by the mother's history of many normal pregnancies.

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FIRST INTERNATIONAL POLIOMYELITIS CONFERENCE

Ten world medical and research authorities on poliomyelitis were recently named presiding officers for plenary sessions of the First International Poliomyelitis Conference to be held in New York City July 12-17. Each of the presiding officers will be assisted by a panel composed of international authorities who have done special work on particular phases of the problem. Papers will be presented at each session and will be followed by open discussions.

Presiding officers are: Oswaldo P. Campos, M.D., clinical orthopedic surgeon, Hospital Jesue, Rio de Janeiro, Brazil; Rustin McIntosh, M.D., professor of pediatrics, Columbia university, New York City; Arthur Steindler, M.D., professor of orthopedic surgery, University of Iowa, Iowa City; Arvid Wallgren, M.D., professor of pediatrics, Royal Caroline Medical Institute, Stockholm, Sweden; Carlos S. Ottolenghi, M.D., Docente Libre de Orthopedia, Buenos Aires, Argentina; James E. Paullin, M.D., professor of clinical medicine, Emory University, Atlanta, Georgia; Pierre L. LePine, M.D., director of laboratories, Pasteur Institute, Paris, France; Harry S. Mustard, M.D., Commissioner of Health, New York City; Thomas Parran, M.D., Surgeon General, U. S. Public Health Service; Irvin Abell, M.D., clinical professor emeritus of surgery, University of Louisville, Louisville, Kentucky.

Summaries of polio problems in other countries will be presented by official delegates who have been invited to represent their governments. Invitations have been extended to more than 60 nations through the state department.

Delegates will be divided into three categories, official government delegates; institutional delegates representing invited universities, societies and scientific and philanthropic organizations interested in research and treatment of virus diseases; and member delegates. The last group will include physicians and other scientific and professional persons qualified by recognized standards.

Subdural Hematoma in Infants

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The recognition of subdural hematoma in infancy has justifiably received increased attention in pediatric literature since the excellent presentation of Ingraham and Mattson[3] in 1944. A great deal has been reported by Sherwood,[1] Putnam, [1] Cushing,[4] Bailey, Peet,[5] and others although until recently most studies were done on adults in whom the problem of prompt treatment is perhaps not as urgent.

No single cause can be attributed to this condition, but a variety of factors has been considered. The majority of observers have felt that trauma was the primary cause of infantile subdural hematoma. A history of significant trauma[3] is commonplace. Ingraham, Ingalls[6] and Sherwood revealed that a significant number of infants (approximately 20 per cent) with this condition had manifestations of scurvy in addition to the primary pathologic condition. Clinical or subclinical deficiency of vitamin C (and more recently vitamin K) is believed by some to lead to capillary hemorrhages precipitated by slight or unsuspected trauma. Ingalls attempted to demonstrate a dietary correlation but his series was not substantiated by vitamin C blood levels in infants who were found to have subdural hematoma. Recent evidence indicates that although maternal ascorbic acid levels are low, fetal levels are almost invariably maintained at least in the neonatal period. Maternal and fetal vitamin K levels have not been carried out on a large enough scale to adequately evaluate the role of prothrombin deficiency (or "hemorrhagic disease of the newborn") in the pathogenesis of subdural hematoma. Much more complete studies must be made before any definite conclusions can be drawn concerning the etiology.

It is evident that if trauma is the cause of subdural hematoma it need not be great or even significant enough to be noticed. A large proportion may be due to minor birth trauma.

In a vertex delivery the trauma of labor contractions may conceivably put a great deal of stress on the brain. Ingraham believes that compression of the brain in this manner causes stretching and tearing of communicating veins which bridge the gap between the cerebral veins and the dural sinuses, particularly the sagittal sinus. He considers this to be the origin of many subdural hematomata. The extravasated blood is thought to settle over the parietal and frontoparietal regions where a variety of symptoms and signs may be produced.

Virchow's original conception of this disease was that of "packymeningitis hemorrhagica interna," an inflammation of the inner surface of the dura with granulation tissue. He affirmed that the hematoma continued to grow in size by the constant breaking of capillaries. Putnam, Cushing and others have been able to find little evidence to support the idea of inflammation which Virchow thought interfered sufficiently with the integrity of the capillary walls to result in rupture and hemorrhage. Most recent evidence points toward trauma, either alone or in combination with systemic, dietary, blood, or vascular deficiencies.

The manner of growth of the membrane has been fairly well accepted to be the result of osmosis. Within a few hours after the initial hemorrhage, infiltration of fibroblasts begins. After several days a thin membrane is formed around the hemorrhage which is filmy and non-adherent on the arachnoidal surface but thick and tough on the dural side. As the red cells within the hemorrhage break down, the number of osmotically active particles increases. Serum is drawn in and the hematoma grows. During this process, which may go on for months, the fluid becomes xanthochromic and sometimes clear. The density and inelasticity of the membrane overlying the rapidly increasing sized brain, as well as the absolute increase in size of the hematoma causes the syndrome to become serious.

Upon tapping or opening the cranial cavity a large collection of the products of blood is found under increased pressure.[3,4,7] The blood does not coagulate and is usually quite dark. As time goes on, there is an ever-increasing amount of fibroblastic proliferation with close adherence of the fibrous tissue to the inner surface of the dura. Usually the number of intact red cells has greatly diminished due to hemolysis. In an old hematoma advanced organization may be found. Occasionally the process has advanced to complete fibrosis and only a dense white membrane is left which, at surgery, is opaque and is usually accompanied by a good deal of cortical atrophy. On occasion only a thin-walled cyst containing clear fluid is found.

There is no characteristic clinical picture in this disease. Probably the generalized signs and symptoms which, in the absence of other findings should suggest subdural hematoma are: (1) failure to gain weight, (2) fever, (3) vomiting, (4) unusual irritability. (The coexistence of some intercurrent infection may be misleading.)

The definite symptoms are most commonly (1) convulsions (about 50 per cent of all patients), and (2) vomiting (about 50 per cent of all cases).

The most common associated symptoms are hyperirritability, excessive crying, or restlessness. Often the diagnosis is complicated by the interval which often exists between onset of the bleeding and the time of occurrence of mild symptoms or signs. This is important because the prognosis becomes more grave as the length of time after trauma increases.

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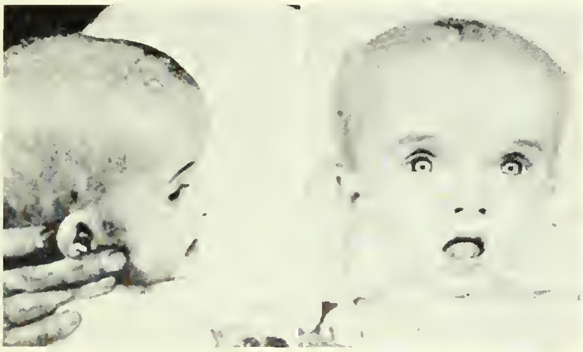
The prominent signs of subdural hematoma listed in order of frequency are:

1. Irregularity of temperature.
2. Hyperactive reflexes and hypertonicity.
3. Bulging fontanelle or enlarging head (most commonly in the biparietal diameter, somewhat diamond-shaped when viewed from above). Figure shows an illustrative case.



Increased biparietal diameter of head, a common sign of subdural hematoma.

4. Abnormal fundi (numerous small retinal hemorrhages).

Attendant to these findings may be signs of secondary disease (scurvy, rickets) and infections (upper respiratory and pneumonia), as well as signs of increased intracranial pressure in some cases (i. e., downward deviation of eyes, bulging forehead, distended neck and scalp veins, etc.).

Laboratory studies of blood and urine are usually insignificant. The spinal fluid is usually negative, although it may be slightly xanthochromic or have a slightly increased spinal fluid protein if concomitant subarachnoid bleeding has occurred. The diagnostic finding is the demonstration of xanthochromic or grossly bloody fluid in quantities over 1 cc. in the subdural space. This is achieved by drawing out fluid with a short beveled spinal needle inserted over the parietal area in the coronal suture, according to the technique of Ingraham.[3] The finding of fluid, even though clear, under pressure in quantities over 1 cc. and with a spinal fluid protein over 30 mg. per cent is presumptive if not definite proof of the existence of a subdural hematoma. Large quantities of blood indicate the more recent, and clear fluid the more chronic subdural hemorrhage. It is extremely important to tap both sides because "contre-coup" injury usually causes hemorrhage on the opposite side as well (over 50 per cent).

After a diagnosis is made by dural taps, a burr hole is made in the temporal region above the ear. This is usually done bilaterally. If the patient is well prepared with blood transfusions, proper feeding, fluid, and high vitamin intake, both burr holes may be done at one sitting. An intravenous drip of 5 per cent glucose should be started just before surgery so that in event of shock, blood may be started immediately. In a few cases the child is so frail as to need two separate procedures. The mortality is almost nil. Fluid is removed by suction and a hematoma clot is sought. If a clot is found, bone flaps are turned and the clot peeled away from the brain. If the clot is too extensive to remove with all the thickened dura, the excision is done as widely as possible and the edges of the wound are incised radially to allow expansion of the brain to fill the cavity. If the brain is compressed a great deal, saline is sometimes put into the cavity to allow slower expansion. Results have been excellent in those cases which are discovered early. Mattson and Ingraham believe that if the hematoma persists more than five to six weeks, the effect is likely to be permanent and the result of surgery disappointing. Daily dural taps with cautious removal of fluid to prevent sudden expansion of the brain are recommended before surgery. The keynote of successful treatment of subdural hematoma is of course early diagnosis.

Conclusions

The study of ten cases by us during the past three years reveals the following points:

1. Signs and symptoms of subdural hematoma are not usually seen in a characteristic clinical picture.

2. The most common signs of subdural hematoma were hypertonicity, convulsions, and abnormal change in head size.

3. The most common early symptoms of subdural hematoma are slow weight gain, irregular fever, vomiting, restlessness, and hyperirritability.

4. Diagnosis of the condition rests upon demonstration of bloody or xanthochromic subdural fluid under pressure.

5. Treatment consists of daily aspirations of the hematoma until the fluid is clear and normal in amount. After this, surgical removal of the hematoma clot and membrane is indicated.

6. Failure to remove the hematoma results in scarring of the dura, inability of the brain to expand, and permanent cortical damage.

7. The keynote of successful treatment is early diagnosis by dural taps.

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Well-Water Methemoglobinemia in Infants

Its Occurrence in Rural Manitoba and Ontario

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In 1945 Comly reported two cases of methemoglobinemia in infants, occurring in rural Iowa. Both infants were fed artificial feedings made up with contaminated well-water of high nitrate content. Following the publication of this report, further cases were reported from Kansas and from Belgium, and by this author from western Canada.

Twelve such cases have been recorded in rural Manitoba and Ontario. The data in some of these cases is not complete so that the diagnosis cannot be said to be proven. Their histories were, however, typical and recovery complete as soon as the diagnosis was made and the use of the suspected well was discontinued. The case histories of these infants are so very much alike that only two of them will be presented in detail.

CASE HISTORIES

Case 1. Baby girl A. H. was born April 24, 1946. The delivery was normal; birth weight 7 lb., 11 oz. The baby's course in the hospital was uneventful and she was discharged on the tenth day as a normal, breast-fed infant.

Within a few days the mother's breast milk became scanty and the baby was given a formula of milk 16 oz., water 14 oz., and syrup 1 oz. For two weeks the water used in the formula was stored rain-water but when the supply ran out well-water was used.

On May 27th at the age of 5 weeks the baby was brought in to the hospital at Vita, Manitoba, because of gradually increasing cyanosis. Except for the cyanosis which had first been noted at the age of 3 weeks, there were no abnormal findings. The baby was brought into Winnipeg for consultation the same afternoon.

On examination the baby had a slate-grey cyanosis, breathed somewhat rapidly and appeared rather listless, although not alarmingly so. There were no signs of disease of the heart or lungs. There was no diarrhea. There was no history of any drugs having been given. With the Iowa cases in mind, the parents were questioned about the water used in preparing the formula and it was then that they realized that the cyanosis developed within a day or two of the change from rain-water to well-water.

Venous blood was drawn, chocolate brown in color. Analysis by Prof. F. W. White of the Department of Biochemistry, University of Manitoba, showed a well marked methemoglobin band. Examination of the well by the Department of Health and Public Welfare disclosed a poorly constructed well, built on down grade, 150 feet from the barn, 250 feet from the house, fairly protected, and close to refuse, manure and pig-pen waste. Analysis of the water from the well revealed a nitrate content of 250 parts per million, indicating gross contamination. The upper limit of safe nitrate content is regarded as 10 parts per million.

The baby recovered spontaneously without any treatment except the substitution of satisfactory water in the formula and has remained well since. This is in accord with the observation of Halpern and Roche, quoted by Ferrant, that if the toxic agent is withdrawn, spontaneous transformation of the methemoglobin into normal hemoglobin occurs and is almost complete after 36 hours.

Case 2. Baby boy M. Born August 9, 1947. Breast fed for one week and then weaned and given a formula of evaporated milk 15 oz., water 25 oz., syrup 1 oz. On September 1, 1947, the parents noted that the baby was cyanosed. They took the baby to a nearby hospital where the baby was thought to have congenital heart disease. However, within 48 hours the cyanosis had disappeared and the baby returned home. Within four days the cyanosis returned again. The baby was brought back to hospital where a sample of blood was taken and noted to be chocolate colored. The baby was brought into Winnipeg for treatment. The cyanosis was barely perceptible when the baby was examined. There was no evidence of disease of the heart and lungs. No treatment was given. Recovery was complete. The parents stated that the water used came from a well situated 100 feet from the barn and from their description was a badly constructed well, in poor repair.

This was then a case of methemoglobinemia due to the use of contaminated well-water of high nitrate content. It illustrates the rapidity of recovery once the water supply is changed and also explains why these cases are seen so rarely by the city consultant—they tend to recover within 24 to 36 hours, so that in the course of a train journey to the city or during a brief stay in a rural hospital en route to the consultant the change in water supply is often all that is necessary to ensure recovery.

ETIOLOGY

In our own cases, as well as in these two cases already referred to, the patient was always an infant under two months of age fed on evaporated or powdered milk formula. The water used in the preparation of the formula came from poorly constructed, shallow wells, often situated on low ground and in close proximity to animal contamination. Examination of water from these wells showed a nitrate content greatly in excess of 10 parts per million, which may be regarded as a safe upper limit.

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The mechanism of production is not altogether clear but the known facts appear to be as follows. Methemoglobin is normally present in blood to the extent of 1 per cent. Methemoglobin in itself is non-toxic but as it is unable to carry oxygen, cyanosis and even death may result depending on the extent to which hemoglobin is transformed into methemoglobin.

Well-water which has been contaminated by seepage from manure piles, pig-pen wastes, etc., contains an excessive amount of nitrate—in some of our cases as high as 200 to 300 parts per million. Normally ingested nitrates are rapidly reduced to nitrites and then to ammonia and excreted as such. Where greatly increased quantities of nitrates are ingested, either due to the ingestion of nitrate drugs, e. g., bismuth subnitrate, or to contaminated well-water as in our cases, the normal mechanism is evidently inadequate and the nitrates are broken down to nitrite and absorbed as such into the circulation. One molecule of nitrite iron unites with two molecules of hemoglobin to form methemoglobin. In some of the reported cases the methemoglobin level has reached 6 or 7 grams, thus leaving only 5 or 6 grams of functioning hemoglobin.

Simple withdrawal of the source of the excess nitrate results in almost complete disappearance of the excess methemoglobin in 36 hours. Clinically this fact has been demonstrated several times in our series. The usual sequence of events is as follows: An apparently normal infant leaves the hospital on its eighth day. For one reason or another breast feeding is discontinued. The baby is then given a formula often consisting of a powdered milk, made up with 28 to 30 oz. of the only available water—the water from the barn-yard well. Within a few days the infant becomes cyanotic, it is brought back to the hospital for observation. With no change in its management other than the use of good water, it becomes well in two days and is sent home. Within a few days the cyanosis recurs. The attending practitioner may make a diagnosis of congenital heart disease or "enlarged thymus" or may find nothing abnormal. The infant is then brought to the city. If the consultant sees the infant at once, the cyanosis is evident, and if blood is drawn a chocolate colored fluid is obtained which on spectroscopic examination is shown to contain a well marked methemoglobin band. If there is delay in seeing the consultant, the use of good water in the preparation of the formula over a 24-to 36-hour period results in the disappearance of cyanosis and the diagnosis can then only be made from the history and examination of a sample of well-water for nitrate content.

Age Incidence

All our cases occurred in infants under two months of age. Older children in the same family and adults using the same water appeared to be unaffected by it.

Case 1. Infant age 3 weeks. Dried milk feeding used. Cyanosis developed one week after arrival home from hospital. Changed to an evaporated milk mixture containing approximately half the amount of water used in previous formula. Improved but still slightly cyanotic. At age of 2 months cyanosis became imperceptible and baby seemed completely well. Has remained well ever since.

Whether the change which occurs at two months of age is due to the increase in size of the infant or to the development of a more efficient mechanism for the handling of excess nitrate ingested is not known.

Relationship to Infant Feeding

Case 1. Twin boys were kept in the hospital until 14 days old. The larger twin being more vigorous was given a dried milk feeding. The smaller twin was completely breast fed. At the age of 3 weeks the bottle fed infant developed cyanosis which became gradually more severe until the correct diagnosis was made and a change made to an undiluted acidified milk mixture. The infant then recovered and has progressed normally. The breast fed infant showed no cyanosis at any time.

Infants who are breast fed or are given undiluted milk feedings do not develop well-water methemoglobinemia. One may therefore add one more argument for breast feeding, especially in rural areas during the first two months of life. Where breast feeding is not available, and the cow's milk not suitable for infant feeding, milk mixtures containing as little water as possible should be used. Better still, *all well-water* used in infant feeding should be tested for nitrate content and only when this figure is below 10 parts per million should it be used.

Differential Diagnosis

Diseases of the heart and lungs must be considered in the differential diagnosis. These can usually be ruled out by careful physical examination. Congenital heart disease may of course be present with no murmur present to assist in the diagnosis. One of our cases, a cyanotic infant artificially fed, age 3 weeks, was sent in to the radiologist with a tentative diagnosis of enlarged thymus. Although the X-ray film was thought to be normal, a single dose of radiation was given. The next day the infant's cyanosis was much improved and by the third day the baby seemed perfectly well. The parents were of course delighted; the radiologist was pleased but puzzled. Within one week of the infant's return to the farm the cyanosis had returned. At our suggestion the water used in the preparation of the formula was changed and water from a nearby town used. Recovery was complete in a few days and the infant has remained well since.

Absolute diagnosis is made by withdrawing venous blood from the infant. Where methemoglobinemia is present, the blood is chocolate brown in color and spectroscopic examination will reveal the presence of a well marked methemoglobin band. Presumptive diagnosis may be made in the absence of a blood sample if the nitrate content of the well-water used in the preparation of the infant's formula is found to be elevated above 10 parts per million. Where neither a blood nor well-water sample is available, presumptive diagnosis is made by the spontaneous disappearance of the cyanosis which follows a change in the well-water being used.

Case 1. Infant age one month. Marked cyanosis. Examination by rural practitioner revealed no evidence of disease of the heart or lungs. Infant artificially fed. Well-water sample showed nitrate content 250 parts per million. Change to more suitable water supply was followed by disappearance of cyanosis.

Case 2. Infant age 3 weeks. Formula evaporated milk 9 oz., water 21 oz., syrup 1 tablespoon. Cyanosis marked. Reported to rural physician by phone. Instructed to use water from adjoining village. Recovery complete within 48 hours. Presumptive diagnosis—well-water methemoglobinemia. Water analysis later showed 220 parts of nitrate per million.

TREATMENT

Spontaneous recovery occurred in all our cases without treatment other than discontinuance of the use of the suspected well-water. Severe cases have been treated successfully using methylene blue as first reported by Williams and Challis in 1933. Experimentally methylene blue will convert methemoglobin to hemoglobin in 10 minutes provided methemoglobin content has not risen to more than 40 to 50 per cent of the total pigment. One mgm. per kilo body weight is given intravenously (0.5 cc. of 1 per cent methylene blue to an infant weighing 8 lbs. would be a suitable dose). Ascorbic acid 100 mgms., intramuscularly, has also been used successfully in the treatment of severe cases.

PREVENTION

Well-water methemoglobinemia is a preventable disease. If all infants were breast fed or were given undiluted milk feedings this condition could not occur. There is great need for serious investigation by public health bodies into the state of rural water supply. Increasing attention is being paid to improving the amenities of rural existence but the old badly constructed unsanitary wells are everywhere to be found. At the very least, no well-water should ever be used for infant feeding unless and until the water has been tested for nitrate content and no water with a nitrate content over 10 parts per million should be used in an infant's formula. It should be borne in mind that boiling contaminated well-water will not lower its nitrate content.

SUMMARY AND CONCLUSION

1. Well-water methemoglobinemia should be considered as a possible diagnosis in all cases of cyanosis in rural infants under two months of age who are artificially fed.

2. It does not occur in the breast fed infant or in the infant fed undiluted cow's milk mixtures.

3. Its occurrence depends on an excess of nitrate present in contaminated well-water used in making up infant feedings.

4. All the infants in the present series recovered spontaneously within 36 hours after the correct diagnosis was made and the use of the contaminated well-water stopped.

5. Public health measures are urged to improve the quality of rural water supplies and to prevent the use of any water containing more than 10 parts per million of nitrate in infant formulae.

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THE THREADS OF RESEARCH IN CHILD LIFE

In November, 1947, the U. S. Children's Bureau called together 16 leaders in research in child life for a two day conference in New York. Through group discussions, the conference considered what research in child life is now going on, in and out of the federal government; on what aspects of child growth and development and of community life in relation to children is research most needed; what the major obstacles to research are; what next steps should be taken; and what contributions the Children's Bureau can make.

In order to answer queries about the conference, the Children's Bureau has summarized some of the highlights. This includes a listing of 136 research projects currently being carried on in agencies outside the government as well as a list of Children's Bureau studies since 1912. This summary of the conference is available from the U. S. Children's Bureau, Washington 25, D. C.—*American Journal of Public Health*, March, 1948.

Arteriolosclerosis in a 9-Year Old Child

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Arteriolosclerosis in childhood has been reported with and without demonstrable urinary abnormalities. The arteriolar changes, notably thickening of the media, have been found on post-mortem studies in the kidney in all of the cases, and less often in other viscera, as well as skeletal musculature. Hypertension is the cardinal symptom. However, slight to moderate degrees of arteriolosclerosis in the presence of normal blood pressure may be found in pyelonephritic kidneys as reported by Kimmel.[1]

The number of cases in the literature is mounting. The first two cases recognized at Johns Hopkins stimulated Guild, Kindell, and Gibson [2] to gather 20 other cases, 15 years of age and under. In addition to their 22 cases, others reported are by Quinby [3] (1 case), Butler [4] (15 cases), Barney and Suby [5] (1 case), Benjamin and Ratner [6] (1 case), Rubin and Rapoport [7] (2 cases), Killian and Calvin [8] (6 cases), Kimmel [1] (8 cases), Semans [9] (1 case), Robertson [10] (1 case); a total of 58. In Kimmel's series is one reported by Kennedy, Barker and Walters [11] as having recovered following nephrectomy. The youngest is the 20-month-old infant reported by Rubin and Rapoport.

The most common presenting symptoms are headache, vomiting, and convulsions. Less common are eneuresis, nocturia, cranial nerve palsies, melena, abdominal pains, gross hematuria, epistaxis, and fatigability.

The physical findings regularly include a hypertension (usually of marked degree), some cardiac hypertrophy, and marked arteriolar spasm with hemorrhages and exudate in the retina.

A 9-year-old white girl was admitted to the University Hospital on February 12, 1947. Five weeks before admission the parents noted she was breathing very deeply and rapidly, with considerable effort. On inquiry she said she had no pain. This attack lasted an undetermined length of time, the parents showing no great concern. However, 16 days before admission, she did complain of painful respiration on coming home from school. That evening, while seated at the table, she suddenly fell forward, gasping for breath. Her lips became blue although the skin appeared pale. She did not lose consciousness, and perspired very freely. In bed she had to be propped in a sitting position.

A local physician on the following day made the diagnosis of bronchopneumonia, although no fever was present. The medications prescribed did not improve the patient's symptoms.

Orthopnea continued throughout the period preceding admission. On February 8 the abdomen became prominent and on the 10th the feet and ankles became definitely swollen.

On February 9, another physician diagnosed asthma and the following day on fluoroscopy he found a large heart and pleural effusion bilaterally. At his suggestion, she was sent to the University Hospital.

Inquiry into her past history brought out several facts which, in the light of her hospital course, seemed to be significant.

The birth weight was 8 lbs., and physical and mental development progressed normally during the first year of life. At 1 year of age her weight was 20 lbs. The first untoward incident occurred at 13 months when three convulsions, each lasting five minutes, occurred during one day. These were relieved by an enema.

On Decoration Day in 1940, when 2 years 3 months old, she developed a high fever. This was attributed to her ingestion of a peony bud the day before. Although she was under a physician's care, her high temperature persisted for two weeks. Following this episode, on which no diagnosis was made, she seemed pale and listless the entire summer.

A pyelogram done during this illness was interpreted to the parents as an erosion of the lining of the kidneys, which would clear up eventually.

Nocturnal eneuresis had persisted since this illness up to the time of admission. Numerous specimens of urine have been examined by physicians in parts of the United States and at no time have abnormalities been found between the ages of 2 years and 3 months, and 6 years of age.

An Idaho physician diagnosed and treated her for anemia and rickets at 3 years of age.

Another significant complaint was that of frontal headache accompanied by nausea and vomiting, lasting from 7 A.M. until evening, occurring about every two weeks, and followed by listlessness for the subsequent day. These headaches began at the age of 3½ years and came at this frequency until 6 years of age.

Since the age of 6 these headaches have occurred every week, and usually on Sundays.

During the year following her fourth birthday she suffered chickenpox, and a severe attack of tonsillitis. Her tonsils and adenoids were removed following this episode. Since this, she has had infrequent colds.

Following her illness at 2 years, a poor appetite had been the rule. Her weights at her birthdays reflected this: birth, 8 lbs.; 1 year, 20 lbs.; 2 years, 24 lbs.; 3 years, 28 lbs.; 4 years, 33 lbs.; 5 years, 38 lbs.; 6 years, 42 lbs.; 7 years, 42 lbs.; 8 years, 42 lbs. Admission weight was 37 lbs.

The most striking physical finding was the marked distress in respiration. She could not stand, and assumed only the sitting position in bed. Her skin was quite pale and displayed a darkly erythematous papular rash anteriorly over the chest, abdomen, and posteriorly over the back. Perspiration was profuse. Although 9 years old, she appeared the height of a 7-year-old child.

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The left heart border was percussed in the anterior axillary line, and the right, 1 cm. to the right of the sternum. No murmurs were present and the tones were strong, the rate being 120 per minute. The blood pressure was 218/176, left arm, sitting. Retinal arterioles were markedly diminished in size, and were interpreted as angiospasm by the ophthalmologist. Fine rales were present in both bases posteriorly. The liver was enlarged to 8 cms. below the costal margin in the midclavicular line and some fullness of the abdomen was present. The spleen was not palpable. A 2-plus pitting edema was found in the lower extremities from the knees down. Mentally she was clear, although very irritable and apprehensive.

Our first impression was that of hypertensive encephalopathy due to glomerulonephritis. The urinalysis showed a 3-plus albumin, no red blood cells, occasional white blood cells, and had a specific gravity of 1.024. Other laboratory findings were RBC 5.5, Hb. 13.9, WBC 15.2, NPN 64 mg. per cent, creatinine 2.7 mg. per cent, serum protein 4.7 grams per cent, CO_2 combining power 42.8 vols. per cent.

Repeated urinalyses throughout her stay showed a persistent 3-plus albumin, with varying amounts of white blood cells, but no red blood cells, and the specific gravity varied from 1.015 to 1.028.

An excretory urogram revealed good urinary secretion in 5 minutes but showed distortion of the calices, suggesting polycystic kidneys. Wrist X-rays showed no evidence of the bony change to be expected in a chronic nephritis.

These findings suggested diffuse arteriolar disease, with possible renal involvement. A biopsy of the deltoid muscle proved negative for periarteritis nodosa.

Therapy tried included magnesium sulfate, aminophyllin, and urea, with no effect on the blood pressure. Barbiturates helped her rest but had no effect on the blood pressure. During her stay, the systolic pressure varied between 165 and 222; the diastolic between 140 and 188; the pulse pressure between 30 and 40. Her terminal course included vaginal bleeding, progressive weakness, disorientation, and a drop in blood pressure to normal values on the day before death, 19 days after admission.

On post-mortem examination the left kidney weighed 38 grams, and the right, 45 (normal, 82 and 83 grams). An aberrant artery was present at the lower pole of each kidney, but no dilatation of either renal pelvis could be seen. Grossly, the cortex seemed thin. Microscopically, a Masson tri-chrome stain displayed a slight fibrosis of the parenchyma and a marked thickening of the walls of the arterioles. The larger ones showed an increased number of cells and unusually prominent lamination. The vast majority of glomeruli were quite normal. Occasional scarred ones were present. The tubules were not remarkable.

The heart weighed 280 grams (normal, 115 grams), the left ventricular wall measuring 15 mm. in thickness, and the right, 3 mm. Projecting from the spaces between the chordae tendinae and papillary muscles in both ventricles were many laminated thrombi, 2 to 10 mm. in diameter. The coronary vessels were not unusual. The aorta showed numerous small atheromatous patches throughout its course.

An arteriole from a section of pectoral muscle revealed the same hypertrophy as noted in the kidney. Other significant autopsy findings were: bilateral pleural adhesions and hydrothorax, numerous pulmonary infarcts, and focal fatty metamorphosis in the liver.

SUMMARY

A case of arteriolosclerosis in a 9-year-old girl with hypertension resulting in cardiac failure is presented. The etiology may or may not have been associated with a previous pyelonephritis.

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The Use of Plastic Nipple Shields for the Lactating Breast

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"MOTHER'S milk is the best milk for a young baby. The breast milk of a healthy mother contains nearly everything a young baby needs for nourishment, in a form that he can digest easily. Not only are breast-fed babies more likely to be healthy than bottle-fed ones, but babies—and usually mothers—enjoy breast feeding. Nursing gives the baby a feeling of contact wtih his mother that satisfies his need to be fondled and loved."[1]

In spite of the known advantages of breast feeding it has been estimated that not more than 25 per cent of babies are breast-fed. The will to nurse the baby is weak in some women because they think it will ruin their form. Others refuse to nurse because it isn't being done in their circle. Education may eventually offset this form and fad objections. But fissured nipples create a situation which the best intentioned mother is unable to overcome.

In the past many remedies have been advanced, such as hot packs, alcohol dressings, silver nitrate, benzoin, castor oil and bismuth, bland ointments, astringent ointments. The nipples have been exposed to air covered with tea strainers, protected by glassine papers, covered by lead, aluminum and glass shields.[2] All too frequently the baby refused to nurse because of the taste of ointments, and the fissures persisted. And all too frequently a formula is the result. The incidence of fissured nipples is quoted at 25 per cent to 50 per cent of lactating breasts. Protection of the nipples will avoid fissured nipples.

This protection has recently been developed in the form of a new molded plastic nipple shield which fits practically every breast and nipple. It is practically unbreakable and is not affected by most of the antiseptics used today. It cannot, however, be boiled or autoclaved.

TECHNIQUE

The following technique for the use of these plastic nipple shields has been devised.

A. *In the Delivery Room*

The nurse who has scrubbed for the delivery removes the patient's soiled gown, uncovers the containers on the tray and then washes her hands. She then pours soap solution on two sterile gauze pads and scrubs each nipple and breast thoroughly, then she washes the axilla also.

Next she moistens two sterile gauze pads with aqueous zephiran 1-1000 solution, places one on each nipple and thoroughly rotates the nipple in the gauze, thus allowing the antiseptic to soak into the skin and nipple. Next the plastic nipple shields which have been previously washed with soap and water and then wiped with an aqueous zephiran 1-1000 solution are placed over the nipples and a breast binder firmly applied.

B. *Daily Breast Care*

The patient receives her daily bath as usual, leaving the breasts and nipples covered with the nipple shields which usually adhere closely during the bath. After the bath the nipple shields are removed and placed on the bedside table and the nipple treated with the sponges as in the delivery room. Then the shield is replaced on the nipple.

C. *Nursing Care*

When the baby is brought to breast the mother is given a sterilized gauze pad saturated with aqueous zephiran 1-1000 solution. She removes the nipple shields, wipes the inside of the breast shield, places it on the bedside table clean side up and proceeds to nurse the baby. Following the nursing the nipple is again covered with the shield.

In warm weather and for those who have excessive leakage and for those who tend to develop an irritation around the circumference of the shield, the areola but not the nipple should be washed with cold water after each nursing before applying the nipple shield.

QUESTIONNAIRES

The following questionnaire was recently submitted to 50 patients, 10 patients a week postpartum and 40 patients six weeks to six months postpartum. Of these 50 patients, 30 are primiparae, 20 multiparae.

TABLE 1

Questionnaire submitted to 50 patients, six days to 6 weeks postpartum.

	Yes		*No*	
	No.	%	No.	%
1. Are the shields comfortable to wear?	45	90	5	10
2. Do they prevent soiling of clothes by milk leakage?	44	88	6	12
3. Do they prevent nipple irritation?	49	98	1	2
4. Did you develop fissured or sore nipples while using shields?	4	8	46	92

A similar questionnaire was submitted to 1000 patients one week postpartum in five Minneapolis hospitals.[3]

TABLE 2

Questionnaire submitted to 1000 patients one week postpartum

	Yes	*No*
1. Are the shields comfortable to wear?	91%	9%
2. Do they prevent soiling of clothes by milk leakage?	75%	25%
3. Do they prevent nipple irritation?	98%	2%

Presented before the Minnesota Society of Obstetrics and Gynecology, November 7, 1947, and the Edmonton Academy of Medicine January 7, 1948.

TABLE 3

Questionnaire submitted to 20 multiparae:
"How does the care of breasts with nipple shields compare with the care of breasts for previous babies?"

Better	17 patients or 85%
Not as good	3 patients or 15%

The comments by patients using these plastic nipple shields are interesting. Adverse comments, in the main, were insignificant and submitted by only a small percentage of patients. They were as follows:

"I am unable to sleep face down because the shields are painful in this position."

"They are too conspicuous to wear except around the house."

"They slip off too easily."

"I developed an irritation around the rim of the shield."

There were, however, many favorable comments showing a large percentage of patient acceptance. The usual comment was, "They are very comfortable to wear." Other comments were as follows:

"They drew the nipple out for the baby so the milk came more readily."

"It was easier for the baby to start nursing."

"They are easy to keep clean."

"They are much more sanitary than the methods I used for three other babies."

Another para 3 remarked, "I did not soil a dress in three months' nursing, but last time I ruined three dresses by milk leakage." Finally, one patient facetiously remarked, "I wore them even after the baby was weaned because they gave me better form."

TABLE 4

Questionnaire submitted to ten nursery and obstetrical supervisors

		Yes	*No*	*?*
1. Is breast care simplified?		9	1	
2. Do babies take the nipple more readily?		8	1	1
3. Does the milk come more quickly?		6		4
4. Which do you prefer in care of breasts?				
Plastic shields	10			
Ointments	0			
Glassine papers	0			
Gauze pads	0			

These supervisors were also asked for their comments which are as follows:

"We used to have at least 25 per cent of patients with fissured nipples, since using the nipple shields fissured nipples are rare."

"The saving of nurse's time is the most important feature of their use."

The only adverse comment was, "Just another gadget that keeps falling off the breast."

Several pediatricians were asked for comments. Their comments reflected their attitude to breast feeding. Those who are thoroughly convinced that every mother should nurse her baby were quite enthusiastic about the shields because of the increased incidence of breast feeding with no fissured nipples. Those not strong advocates of breast feeding were not interested in the shields. Maybe there is need to educate our pediatric brethren in the value of breast feeding.

CONCLUSIONS

An analysis of these questionnaires and of impressions received in discussing them with nurses and patients reveals several advantages of plastic nipple shields for the care of lactating breasts.

1. They are comfortable to wear, protect the nipple from irritation, and tend to prevent milk leakage.

2. Sore, cracked and bleeding nipples rarely occur—as a result, infections are less frequent.

3. The technique of breast care is impressed upon the patient, making her "antiseptic technique conscious."

4. Because of less incidence of fissured nipples there has been a greater incidence of breast feeding for longer duration.

5. Ointments or $AgNO_3$ are not necessary, except in only occasional cases.

6. The shape of the shield brings out the nipple and the baby appears to take the nipple more readily. It seems too that the period until the flow of milk—"the latent period"—is shortened.

7. From the nursing point of view, breast care is much simplified, thus leading to a considerable saving of nurse's time.

SUMMARY

A new plastic shield has been presented which appears to offer definite advantages in the care of the lactating breast, both in the immediate and remote puerperium.

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CORRECTION

Due to a dropped line on page 118 of the April issue, the leading author's name, G. Wilson Hunter, M.D., F.A.C.S., was omitted from the article, "Surgical Sterilization in Women: A Ten Year Study." The editors regret that Dr. Hunter's name was not attached to this valuable study.

The Value of a Psychiatric Consultant to a University Student Health Service*

Harriot Hunter, M.D.,† and Mary Linda Gorton, M.D.
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In December, 1944, after several requests by Dr. L. W. Holden, Director, Student Health Service, University of Colorado, and at the suggestion of the Psychiatric Liaison Department of the Colorado University Hospitals, a service was inaugurated whereby a psychiatric consultant was made available to the Health Service once a week to see students with emotional and personality problems. With the exception of several weeks during vacation, the service was continued regularly for one year. This paper is a report on the 94 students seen by us during that period, with the main purpose of emphasizing the need for such a service in all university or college health departments.

Statistical Survey

Table 1

	Number	Per cent
Male	41	43.6
Female	53	56.4

Out of a total of 94 cases seen, there were 53 females, or 56.4 per cent, as is seen in Table 1. There is thus an apparent slight predominance of females, which seems further emphasized by the fact that during this period the number of enrolled males was 4306 as compared with 4102 females. However, the average number of females visiting the Health Clinic for general complaints runs usually about twice that of males who make visits to the clinic, so therefore there is actually not as great a number of females as would be expected.

Table 2

Age	16	17	18	19	20	21	22	23	24	25 plus
Number	1	5	17	17	13	9	6	9	2	14

With the exception of one teacher of 57 years, the average age of the students seen was 21.7 years. This is about the usual college age, but when it is noted below that the majority of students seen were in the freshman class, this figure seems a little high. We believe this is accounted for by the fact that there were a number of veterans seen who were a good deal older than the average college student, and most of them were in the freshman class; this brought the average up slightly. It is noted that the largest number in any age group fell in the two groups of 18 and 19 years. This is probably due to the fact that more of the general college population are in these particular years, but it is also true that these are the ages where most of the present types of problems exist.

Table 3

	Number	Per cent
Army	17	50
Navy	17	50
	—	—
Veterans	34	36.1

There was a total of 34 veterans in the group, or a percentage of 36.1 per cent. The number of veterans enrolled on the campus during that period was 2366, or a percentage of 28.1 per cent of the total enrollment, so it seems possible that as a group the veterans may have needed more help than the non-veterans. However, we do not believe that the problems of the veteran are any more severe or unusual than the average problems presented by the group as a whole. It is also possible that the veterans as a group are more aware of their need for help and more amenable to psychiatric therapy because of their experience in the armed services.

Table 4

	Number	Per cent
Freshman	38	40.4
Sophomore	21	22.3
Junior	18	19.3
Senior	8	8.5
Graduate	8	8.5
Teachers	1	1.0

Of the total number of individuals interviewed, 40.4 per cent were in the freshman class. This is an important fact from an educational standpoint, and entirely understandable. We believe that the type of emotional and personal problems presented by these students is usually much more pressing at the beginning of the college career. It is at this time that the individual is bewildered, confused, and overwhelmed by the new types of experiences he is meeting, the responsibilities he is faced with, and the sudden emancipation he must go through to become an independent, self-reliant person. He is seeking adult advice and guidance at this time, and it should be readily available to him. It is in this period that so many problems can be solved which often

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become more serious and intractable later on. It is also true that students who have personality problems are more apt to drop out of school as time goes on, especially if the problem originates from a personality disturbance that is not properly cared for, and the student drops out of school as a "psychiatric casualty."

TABLE 5
Referrals

	Number	Per cent
Student Health Physicians	71	75.4
Self	11	11.9
Teachers	3	3.2
Speech Department	5	5.3
Other Students	3	3.2
Psychology Department	1	1.0

This table reveals some interesting data. The majority of referrals came naturally from the Student Health Service and were referred by the two resident physicians on the staff, both of whom were familiar with psychosomatic conditions and student emotional problems. However, once the service was established a number of students came in voluntarily to seek help. Some of these had been to a Mental Hygiene lecture and wished to ask questions concerning some aspect of the lecture; still others had heard about the new service around the campus and sought help on purely personal problems which were not necessarily of a medical nature and would not have otherwise brought them into the Health Service. Several students were sent in by their roommates or friends. It is rather surprising that more students were not referred from the psychology department where many students ordinarily take problems of this sort.

TABLE 6
Disposition

	Number	Per cent
Advised	46	49.0
Accepted for treatment	43	45.7
Referred to other psychiatrists	5	5.3

It may be noted that approximately 50 per cent of the students were simply advised either in one or two interviews. Only 45 per cent were accepted for treatment and only 25 or 26.6 per cent of the total number were brought back for more than three interviews. This was obviously because of lack of personnel and time. Many more students could have been seen over a longer period of time if time had been available. Fortunately, most of the problems were of the type that lend themselves beautifully to short-term psychotherapy. Of the 5 students referred to another psychiatrist, two were advised to drop out of school and take a quarter or more off; the other three were going home on vacation and were advised to seek treatment there.

Upon referring to the diagnostic table, it may be noted that the majority of cases fell into rather mild diagnostic categories. Actually only 3.2 per cent of the total cases were serious enough to be admitted. This is lower than the usual percentage of cases seen in a hospital out-patient department who need to be hospitalized. The percentage of serious illnesses or untreatable personality disorders was low, about 17 per cent. It should also be noted that the total number of diagnoses does not correspond to the total number of cases since occasionally a supplementary diagnosis was made in the same case, i. e., "Emotional Immaturity, Psychosomatic Illness."

TABLE 7
Diagnostic Breakdown

Emotional immaturity	14
Anxiety tension state	12
Other psychoneuroses	13
Psychosomatic cases	8
Simple personality problems	9
Schizoid personality	12
Schizophrenia	7
Constitutional psychopathic personality	9
Stutterers	5
Hysterical personality	3
Depression	3
Mentally retarded	1
Congenital spastic	1
Combat fatigue	1
Post-traumatic	1
Psychomotor	1

In addition to the interviews, two other diagnostic procedures were included. Three electro-encephalograms were done on three male patients with suspicious histories. Twenty-six Rorschach examinations were given to selected cases by our psychiatric social workers who accompanied us.

TYPICAL CASE RECORDS

In general the cases fell into two large groups: those accepted for treatment and those not treated. This division is entirely artificial and was brought about by the exigencies of the situation. There were many more referrals than could be handled by one consultant and, in order to facilitate treatment of those who stood the best chance of benefiting from treatment, certain cases were immediately advised or diagnosed and not seen again. Thus Group I contains certain subgroups:

Group I. Cases not accepted for treatment: 51 (54.2 per cent)

A. Cases which were diagnosed as serious mental illness and hospitalized: 3 (3.2 per cent)

B. Cases which were diagnosed and not treated: 13 (13.8 per cent)
Constitutional Psychopathy: 9 (9.5 per cent)
Schizophrenia: 3 (3.2 per cent)
Mental Deficiency: 1 (1 per cent)

C. Cases of simple personal or situational problems which could be advised in one or two interviews: 19 (20.2 per cent)

D. Cases of students who were not returning to school, some of whom were referred to a psychiatrist at home (5): 13 (13.8 per cent)

E. Cases of students who broke appointments and did not return for treatment: 3 (3.2 per cent)

Group II. Contains students who were accepted for treatment: 43 (45.7 per cent).

A. Students with emotional problems, who were seen and treated in 2 or 3 interviews and who benefited from therapy: 18 (19.2 per cent)

B. Students who were given a longer period of treatment, who had over 3 interviews: 25 (26.6 per cent). Of these only three showed no improvement after therapy.

Typical of these groups of cases are the following brief summaries:

GROUP I. NON-TREATED

A. Serious mental illness:

R. P.: A 21-year-old boy from a small town in Colorado was seen at the Health Service as an emergency because of his distraught manner and the incoherency of his speech. He came in reporting that he had been upset in his psychology class because he believed the teacher was lecturing about him; furthermore, he had several good friends on the campus who had recently begun to "psychoanalyze" him. He was extremely confused and blocked often during the interview; he hinted at thoughts of suicide and was self-reproachful about his poor grades. The referring physician reported that he had been talking incoherently to various people on the campus about his "sins." He was diagnosed as having an acute schizophrenic reaction with many paranoid and depressive ideas. Immediate hospitalization at the Colorado Psychopathic Hospital was recommended. He remained there four months and received insulin and electric shock therapy. He was discharged much improved. The immediate etiological factors were thought to be: apparent break in close family ties, worry over failure to make the grade after induction into the Army, guilt over recent departure from rather moralistic upbringing, and consistent failure to make good grades.

B. Diagnosed as untreatable chronic personality disturbance:

L. W.: This 22-year-old Army veteran also was seen as an emergency in the Denver office, where he came with his wife. The immediate complaint was brought to the attention of the Health Service by the wife because of the student's repeated week-end drinking bouts, his recently developed indifference to her, and his failure to study. He had a long history of failure to adjust with many incidents involving asocial behavior and an N-P discharge from the Army. He admitted to his wife (a well-adjusted, fairly successful, although somewhat naïve business woman) that he had married her only to use her to further his own ends. This case seemed to be an all-too-obvious one of Constitutional Psychopathy. The wife was advised and the case dismissed.

C. Cases of simple personal or situational problems:

M. D.: This 21-year-old girl came in complaining of headaches and depressed spells. These symptoms originated out of a period of worry for over a year concerning her college work. Talented in music and having been fairly successful in that field in a small town, she found that at college her ambitions and her idea of her own success far outstripped her actual accomplishments in the music school where competition was greater, and she began to be depressed over her work. In addition to this she had been exposed to more liberal ideas about religion at college which conflicted with her strict, sheltered upbringing. She had a very good understanding of her problems and, after some simple explanation was given to her concerning her physical symptoms and a friendly adult ear was lent to her conflicting religious ideas, she was much relieved and was able to work out her own problems from then on.

D. Cases who were not returning to school:

V. E.: This girl was an immature 18-year-old who was seen as an emergency because of a suicidal attempt on the campus. (Three of the total number of cases had either attempted or threatened suicide.) This particular student was a typical college girl, who, because of a basically immature personality, a rather tragic family background, and a series of unfortunate events concerning her on the campus, had decided on the melodramatic course of drinking a bottle of iodine. The girl was socially attractive and popular on the campus, but had many underlying conflicts in her personality and background. Her mother, who was financially as well as emotionally insecure, had been more or less indifferent to the patient's upbringing and represented in her daughter's mind a particularly obnoxious character, reminding her constantly of all the evils of poverty, alcohol, and sex. When she reached college, this girl began to be awakened to much more meaningful ideas and philosophies by her contacts on the campus, and realized that her old social set was shallow and narrow-minded. When she "broke" with them, they began some unfounded gossip about her which precipitated her already well-established feelings of guilt and depression. After two lengthy interviews, she was persuaded to go through with her exams and advised to make summer plans to visit a new college friend in another state. She was advised to consult a psychiatrist in that district during the vacation.

GROUP II. CASES ACCEPTED FOR TREATMENT

A. "Short-term" treatment of emotional problems:

There is actually very little difference between this group and Group C above except for the fact that the problems above were usually in the nature of an immediate situation which could be straightened out by guidance and advice from an experienced counsellor, whereas those of this group were mild personality problems which actually needed treatment and benefited from interviews which were limited because of lack of time and personnel.

J. H.: A 20-year-old Freshman student was seen because of complaints of nervousness, poor sleep, headaches, and inability to concentrate. She was depressed and bothered with feelings of uselessness and hopelessness about her college work and her future life. All of these symptoms developed in direct relation to the recent death of her Army husband with whom she was very much in love. She had heard of his death during the summer while she was working. When she decided to leave her job, her friends in the office persuaded her to begin college in the fall. She did so primarily because she and her husband had planned to go together, but she was without a very good idea as to what she planned to do in the future or what kind of degree she wanted. She was also beginning to date again, and was probably having guilt feelings in relation to the development of an interest in one of her escorts which she felt was disloyal to her husband. She was advised during two short interviews which resulted in tremendous improvement and much gratitude and relief. She was told to work out her plans for four years of college only if she could be sure of her reasons for wanting a degree, to choose her subjects accordingly, and by all means to try to live a normal campus life. She was gently advised that dating and interest in the opposite sex was entirely normal and was encouraged not to cut herself off from it. Her feelings of guilt were explained to her simply, and her physical symptoms were interpreted as a result of anxiety and tension.

This case is typical of the group which needed only superficial guidance and simple advice and never failed to benefit markedly from one or two interviews.

B. "Long-term" treatment:

This group contained the largest variety of diagnostic headings. As can be seen from the statistical table, the majority fell into the four classes: Emotional immaturity, schizoid personality, anxiety tension state, and other types of psychoneurosis. There were also in this group a few psychosomatic cases and four stutterers referred from the Speech Department. Those cases of simple emotional immaturity so prevalent in a college group usually fell into Group A of Group II and needed only a few interviews to be helped. Many of the students seemed to be rather asocial, shy, withdrawn types of individuals with somewhat foggy thinking and were diagnosed as being a "schizoid" type of personality. Some of these individuals had physical complaints and some were also of neurotic character.

L. O.: This 22-year-old boy was a Navy veteran and had seen his diagnosis on his medical discharge papers, which said "schizoid personality." He came home after a rather severe emotional breakdown in the navy and for some months was brooding and preoccupied with the term "schizoid." He proceeded to look it up in dictionaries and psychology textbooks where he found further cause for dismay and confusion in such terms as "manic-depressive," "introvert," "homosexual," "Oedipus complex," all of which in some way he referred to himself. He came to college to study journalism and found that he was periodically depressed to the point where he could not concentrate on his work. He was a very attractive, intelligent student and had many positive traits in his character and personality which were emphasized and brought out as the interviews progressed. He responded very well to common-sense psychotherapy and a logical, organized discussion of his problems, fears and shortcomings. He improved remarkably well during the six months of interviews and maintained his good adjustment after graduation.

P. B.: A 20-year-old Junior who was seen over a period of two months of weekly interviews because of anxiety and many vague fears and crying spells. She was an extremely small but attractive girl who had been suffering with varying degrees of anxiety over a period of several years due to various conflicts concerning family problems, adolescent and sexual adjustments. She had fallen in love at 16 and for four years had been "going steady." This boy was drafted and left for overseas during this period; before he left they became engaged and on several dates had indulged in rather extensive petting. While he was away she had marked anxiety and guilt feelings concerning this activity, but later on transferred her feelings to the more benign worry over her social adjustment. Any situation in which the least attention was called to herself would immediately result in the most uncomfortable bodily symptoms typical of anxiety: flushing, palpitations, dryness of the throat, and inability to speak, a "sunken feeling in the pit of the stomach," and hot and cold sensations in different parts of the body. As a background for this was the parental picture. Her mother was a rather emotionally unstable woman who had had several "nervous spells" and told her daughter she had had the same fears while she was pregnant with the patient. Her father was an unusually successful but rather strict, irascible, and distant personality for whom the girl had almost a hero-worship type of feeling. Gradually, over a period of weeks, she obtained a great deal of relief by being able to discuss her fears and the personal problems to which they were related and, when vacation time came, she was much improved.

DISCUSSION

As can be seen from the cases presented, there was a wide variety of problems among the students interviewed, from simple problems concerning choice of major subject, or "girl-friend" or "boy-friend" trouble, to more serious mental and emotional maladjustments. This is entirely natural and, as Clements Fry [1] has often pointed out, this group of college age individuals is notably in need of the type of psychiatric guidance and therapy that can be offered in a health service set-up because of the problems peculiar to the setting and age group: those of adolescence, the awakening of new and adult ideas, and the concurrent emancipation from previous family and religious ties. These problems in a basically poorly adjusted individual can easily develop into one of the more serious psychiatric reactions, such as schizophrenia, and are often accompanied in neurotic personalities by a large number of physical symptoms. When unheeded and untreated, these conditions can sometimes develop into chronic, incapacitating diseases which add to the already too long list of hospital cases. The beauty of these cases is, however, that they lend themselves easily to treatment and the therapeutic response is more than gratifying. So many times it seems that an incipient mental illness may have been "nipped in the bud," and many a disorganized, poorly adjusted personality helped to become a constructive, worthwhile and happy member of the community.

The benefit of such treatment to the individual student is matched by the benefits enjoyed by the medical staff of the health service. It represents a tremendous saving in time and energy in the first place. In this particular experiment, two medical doctors were handling approximately 100 cases a day. If a day of work was about 8 hours, that would mean that each student would have an average of approximately 8 or 9 minutes worth of attention. This may be enough for sprained ankles, sore throats, and minor complaints, with a little more time being allowed for physical examinations, X-rays, B.M.R.'s, and a little less for the frequent dispensation of drugs by the nurse. Understandably enough, however, it is not sufficient for a student who wants to try to explain to someone that he has nightmares at night and is depressed and beset by vague fears all during the day; or the student who has many physical complaints with a background of family insecurity and emotional maladjustment. These things take a good deal of time and constitute the type of thing that can easily "heckle" an already distraught director of an overloaded student health set-up. Dr. Holden states [2] that he believes from 25 to 40 per cent of his cases should be seen by the psychiatrist.

This gives some indication of what the problem is. Dr. Holden's figures agree with those of the population as a whole and the consensus concerning Army figures. This means that approximately one out of every four college students coming to the health service of a university should be seen by the psychiatrists. Any university or college with an enrollment of over 500 should have available at least a part-time psychiatrist. With the rapidly increasing enrollment over the country as a whole, this problem is reaching staggering proportions. Dr. Lewis Barbato, recently employed by the University of Denver as a full-time psychiatrist, has stated [3] that within the first few weeks his appointment schedule was heavily loaded with several new cases coming in every day.

As to the manner in which these cases come to the attention of the psychiatrist, this is largely a matter of how well established the service is and, especially, how well oriented the physicians at the health service may be in recognizing neurotic symptoms and personal problems. Once a service is set up, there will be no lack of individuals who will come in for help voluntarily, or who will be referred by the many departments on the campus. Students will be sent in by their roommates, by friends who have received help, by their teachers, by their faculty advisers, by the Student Counselling Service, by the dormitory heads, and by the Speech and Psychology Departments. There should be a ready liaison between these latter departments and the psychiatric consultants in order to save time and grief by seeing the students early. There should also be close liaison with the Physical Education Department or whoever happens to be concerned with presenting customary mental hygiene lectures.

Some word should be said concerning the value of such a service in a psychiatric training program. The two authors took part in this work during the last year of their three-year Commonwealth Fellowship in psychiatry while training at the Colorado Psychopathic Hospital. It not only proved to be valuable from a training standpoint, because cases of this type and in this age group are rather rare in a hospital service, but it was extremely gratifying from a therapeutic standpoint. A good percentage of the cases seen in psychiatric hospitals are naturally either far-advanced chronic cases or have illnesses of such severe proportions on admission that many times little progress is seen in the course of treatment. On the other hand, these cases seen at the University were young people with milder problems and earlier mental disturbances which were usually amenable to treatment and rapid results were often seen.

A note of warning should also be sounded to those who believe that such simple problems as some of those outlined above can be treated by the campus psychologist or any sympathetic counsellor. Such is not the case, and indeed is an extremely dangerous view to hold. Only a psychiatrist or an especially trained psychiatric social worker under psychiatric supervision is equipped to recognize the more deep-seated, serious illnesses from some of the simple surface phenomena; and only a physician can be sure how far to go in interpreting physical ailments as an outgrowth of emotional disorder.

Summary

1. Ninety-four cases of students with emotional difficulties were seen at the Student Health Service of the University of Colorado.

2. A statistical survey of these cases is presented.

3. Review of the year's work proves that a psychiatric consultant is an invaluable adjunct to any university health service from the following viewpoints:

    a. Preventing mental disease.
    b. Providing practical mental hygiene for the students.
    c. Time-saving from the resident physicians' standpoint.
    d. Providing a valuable part of a graduate psychiatric training program.
    e. Increasing the efficiency of the health service and the university or college as a whole.

4. Where facilities are available, the same purpose may be more adequately served by a full-time mental hygiene clinic.

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1. Fry, Clements: Mental Hygiene in College. New York Commonwealth Fund, 1942.
2. In letter to authors.
3. In letter to authors.

AMERICAN STUDENT HEALTH ASSOCIATION

Dr. R. W. Miller is no longer Director of Student Health at the Medical College of Virginia, Richmond, Virginia. Dr. William R. Kay is now Student Health Physician.

Walter E. Batchelder, M.D., Director of the Student Health Service at the University of New Hampshire, has resigned effective June 30, 1948, to accept a position with the State of Rhode Island as Director of their Cancer Control Program. Dr. Hector Thibault, Assistant Director of the Health Service at the University of New Hampshire, will be Acting Director after June 30, 1948.

George F. Parker, M.D., Director of Student Health Service at DePauw University, Greencastle, Indiana, who has been associated with Health Service work for eleven years, is resigning July 1, 1948, to go into private practice. Dr. O. R. Dobbs of St. Louis, Missouri, will officially take over the directorship of the Student Health Service at DePauw University, effective July 1, 1948.

Book Reviews

Diccionario Terminologico de Ciencias Medicas, by S. Cardenal, M.D., Salvat Editores, S. A., Barcelona and Buenos Aires. Third edition, 1945. 1324 pp., illustr. $20

The shortage of Spanish medical dictionaries makes this third edition very welcome to the many who are interested in Spanish medical terminology.

What makes this volume particularly valuable is that each basic word is translated into German, French, English, Italian and Portuguese; its derivative is also given. While the definitions are not in English, they are presented in such simple Spanish terms that anyone with a slight knowledge of Spanish will have no difficulty in understanding them.

In a section of independent vocabularies the more common medical words are given in Spanish and the following other languages: German, French, English, Italian and Portuguese.

The appearance and legibility of the book are very good and it has a durable binding. It will prove a helpful addition to any medical library or private practice where Spanish is employed.

R. B.

Comparative Studies in Tuberculosis and Histoplasmosis among 2000 Students

Entering Pennsylvania State College September 1947

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Pennsylvania State College, State College, Pa.

In epidemiological studies for tuberculosis, the finding of the individual case, the discovery of the source of his disease and the follow-up of his contacts are the important ramifications of such investigation.

For all practical purposes a negative tuberculin test rules out tuberculous infection.

The finding of primary tuberculosis in a child (or a recent infection in an adult) establishes two important facts: (1) Usually a contagious case has been in the individual's environment. (2) The individual has lesions containing living tubercle bacilli. Moreover, his tissues have become so sensitized to tuberculo-protein that this substance is now a deadly poison to them. This sensitivity is demonstrable by skin testing with the several known methods.

It is axiomatic that the longer an individual is tuberculin positive the more difficult it is to run down the source of his infection; hence, the desirability for retesting certain individuals and groups at periodic intervals. Determination of tuberculous infection by X-ray has been found quite unreliable in a majority of instances in contradistinction to tuberculous disease of the lungs which, of course, is readily determinable by chest X-ray.

Sweany has shown that calcification of the lesions of first infection tuberculosis in the thorax is demonstrable roentgenologically in only about one fourth of the existing cases and such calcification, when found, has no significant meaning. In a study at Mayo Clinic only one in 68 calcified and fibrotic lesions removed at autopsy caused tuberculosis in guinea pigs. Also, a fair amount of the pulmonary calcification demonstrated by X-ray occurs in negative tuberculin reactors. Thus it becomes necessary to explain such calcifications, often extensive in amounts, in some other manner.

With the aforementioned facts before us, we attempted to learn in this survey:

1. The results of careful Vollmer patch testing when compared with intradermal P.P.D. in both male and female students.
2. The amount, if any, of active tuberculosis and histoplasmosis to be found in this incoming undergraduate group.
3. The number of students, most of whom are Pennsylvanians, who react to intradermal skin testing for histoplasmosis and to compare these results against X-ray determinations of these subjects and finally to compare our results with those of C. E. Palmer of the United States Public Health Service for our geographic area.

We have been of the none too popular opinion for some years past that the percentage of error between a carefully applied, properly prepared, patch (Vollmer) test and that of two strength (P.P.D.) intradermally was low enough to be of little importance in the mass testing of individuals.

The permanency of the Vollmer patch as compared to P.P.D. is important in the routines of industrial medical establishments, student health services, physicians in practice and other agencies dealing with large, and especially with small, groups of individuals at irregular periods of time.

In our work at The College Health Service, we consider careful application of the patch to consist of:

1. Selection of a thin-skinned hairless site.
2. Thorough cleansing of the skin at this selected site with a fat solvent agent (acetone).
3. Complete instructions to the individual for its care following the application.
4. Removal of the patch by the medical agency so as to be sure that the patch has been in place for the required amount of time.
5. Prompt and careful reading of results by physicians who have prepared themselves by study for the proper interpretations.

The careful preparation of the patch consists mainly of: (1) a uniform known strength of tuberculin material used in making the patch; (2) normal mechanical care in its application to the adhesive surface.

This mode of testing is always more popular with the subject than the use of hypodermic needles and in young student groups constitutes at least a minor point in favor of the patch test.

Our statistical report, as follows, seems to lend support to our opinions in this regard. All students were tested with Vollmer, 1st and 2nd strength P.P.D. and intradermal histoplasmin.

	Men	Women	Total
Total number who completed tests	1,740	412	2,152
Positive P.P.D.	23.9%	14.3%	22.1%
Positive Vollmer	21.3%	15.5%	20.2%

Differential P.P.D. to Vollmer—Total	1.9%
Differential P.P.D. to Vollmer—Men	2.6%
Differential P.P.D. to Vollmer—Women	1.2% more positive with Vollmer than P.P.D.

The results shown for women, P.P.D. to Vollmer, were influenced, at least in part, by accidentally injecting P.P.D. subcutaneously instead of intradermally in approximately 2 per cent of thin-skinned females.

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*From The College Health Service, The Pennsylvania State College, State College, Pennsylvania.

Further statistical breakdown shows:

	Men	Women	Total
Subjects having positive 1st P.P.D. and negative Vollmer	1.4%	0.0%	1.1%
Subjects having negative 1st P.P.D. and positive Vollmer	4.5%	6.5%	5.0%
Subjects having positive 2nd P.P.D. and negative Vollmer	2.5%	0.97%	2.2%
Subjects having negative 2nd P.P.D. and positive Vollmer	2.0%	3.1%	2.2%

Thus, it would seem from these statistics that the value of the Vollmer patch test is well established. Hence, this test may be used in preference to the intradermal test without sacrificing accuracy whenever the circumstances make it more desirable.

One other comment is considered worthy of note in tuberculin testing; namely, that a 4-plus reaction when using 0.1 cc. 2nd strength P.P.D. occurs about three times per one thousand students in our experience. Since neither the student nor his parents are grateful for such severe reactions, we attempted to avoid them by giving, in the above series, 0.07 cc. as the 2nd strength dose. With this amount we had no 4-plus or necrotizing reactions. We feel that the 0.07 cc. is a sufficient amount for 2nd P.P.D. testing. This is especially true when it is considered that 0.1 cc. is 250 times as strong as the accepted amount for 1st P.P.D. testing, and the large increase between the 1st and 2nd P.P.D. amounts is contrary to the general allergic skin testing practices in which multiples of ten are used as a maximum ratio for increasing subsequent skin testing strengths.

This incoming class did not have a single case of active tuberculosis or tuberculous disease in the 2,152 students tested.

This contrasts sharply with a subsequent examination of a smaller group involving 350 students in an Extension Center where two active cases of pulmonary tuberculosis were found.

Our statistics from the Department of Health, Bureau of Tuberculosis Control, who performed our X-ray studies, show:

70 MM. X-RAY SURVEY
THE PENNSYLVANIA STATE COLLEGE
STATE COLLEGE, PENNA.

"The following are complete statistics of all persons X-rayed during the survey at Penn State College, State College, Pa.:

Total number of X-rays taken	2,152
Total imperfect films	5
Suspicious of tuberculosis	2 — 00.05%
Primary inactive tuberculosis	5 — 00.23%
Negative	2,140 — 99.72%

Included in the above totals is the following:
Foreign body present — 1."

The five imperfect films and those reported as suspicious and the reported primary inactive tuberculous cases were restudied on 14 x 17 films and all found to be negative.

Recent interest in histoplasmosis prompted us to test this group of 2,152 students with intradermal injections of histoplasmin to determine the positive reactors. This class was made up almost entirely of undergraduates whose homes are in Pennsylvania.

For many years calcified lesions in the lungs and tracheobronchial lymph nodes were considered pathognomonic of tuberculosis even in the absence of a positive tuberculin reaction. The lack of tuberculin sensitivity was ascribed to a biologic sterility of the lesions. Christie and Peterson in reviewing the papers on the subject over the past twenty years found a consistent discrepancy between the results of tuberculin tests and the presence of pulmonary calcification.

This observed discrepancy led to the consideration of the mycoses as an explanatory factor in the presence of pulmonary calcification and negative tuberculin tests.

Smith reported that evidence of histoplasmosis was found frequently in areas where pulmonary calcifications were found in association with negative tuberculin reactions. Subsequently, C. E. Palmer of the U. S. Public Health Service undertook detailed studies of this phenomenon, finding that geographical area appears to be a significant factor determining the incidence of positive reactors to histoplasmin. He found the highest percentage in East Central U. S. (Mississippi River Basin) with decreasing frequency with increasing distance from this area where 68.2 per cent of 1,049 lifetime residents gave positive reactions to histoplasmin. Northwest and south of this area the incidence dropped to 23.1 per cent and to 37.5 per cent, with only 10.1 per cent positive reactors in the Northeast, including the New England states.

Furcolow, High and Allen in a study of 6,528 Kansas City children found pulmonary calcification in 26.4 per cent of the histoplasmin reactors and in 11.4 per cent of the tuberculin reactors, with only 2.6 per cent of 3,566 individuals negative to both histoplasmin and tuberculin showing pulmonary calcification.

It appears, then, that the generally accepted ideas concerning pulmonary calcification will have to be modified. The question of specificity of the histoplasmin reaction is still to be settled.

According to our survey of the literature, since 1905 when the first cases were reported in the Canal Zone, only 82 reports of histoplasmosis are to be found. All of these patients died of this disease.

Statistics for our studies follow:

	Men	Women	Total
Total number who completed tests	1,740	412	2,152
Positive Histoplasmin	12.5%	5.3%	11.2%
Subjects having positive histoplasmin and positive tuberculin	3.7%	0.97%	3.1%

It is interesting to note that Palmer reported 10.1 per cent positive reactors in the Northeastern section of the United States, and that our percentage of 11.2 per cent for Pennsylvania certainly correlates closely with his findings in a study of over 2,000 undergraduates.

It was strikingly observed that all histoplasmin tests were easily read, being either definitely positive or negative. Even though the question of specificity of histoplasmin testing is still to be settled, no "difficult to read" or border line reactions were encountered in the whole group.

In spite of a 11.2 total percentage of histoplasmin positive results, the calcifications by X-ray in these individuals were conspicuous by their absence.

It is also of interest to note that in this histoplasmin series more than twice as many men showed positive reactions as women.

SUMMARY

A study of 2,152 individuals who were inoculated with P.P.D., 1st and 2nd strength, and tested at the same time with the Vollmer patch and intradermal histoplasmin showed a series of interesting results.

The percentage of differential between the use of intradermal P.P.D. and well managed Vollmer patch testing is so small that the choice of either test should probably be governed by the availability and convenience in any given circumstance.

No cases of reinfection tuberculosis were found in this series. This result is contrasted to a much smaller study where two active cases of pulmonary tuberculosis were discovered in 350 individuals of similar age status.

We also found our histoplasmin positive individuals from Pennsylvania to correspond to the percentage found by Palmer in his geographic study of the United States for this area. The intradermal testing with histoplasmin is extremely accurate and the results are easily read.

Massive calcifications in this group, in spite of a 11.2 per cent positive histoplasmin test, were conspicuous by their absence.

More than twice as many men as women from this Pennsylvania group were positive histoplasmin reactors.

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We wish to acknowledge advice and encouragement given by John L. Rice, M.D., of the Lederle Laboratories Division, American Cyanamid Company, who furnished the Vollmer patches; Carroll E. Palmer, M.D., Senior Surgeon, Field Studies Section Tuberculosis Control Division, U. S. Public Health Service, and Arden Howell, Jr., Ph.D., Mycologist of the same Bureau who furnished the 1-1000 solution of Histoplasmin.

We also would like to acknowledge the services of the Department of Health, Bureau of Tuberculosis Control, Commonwealth of Pennsylvania, M. C. Stayer, M.D., Director, who supplied materials and personnel for our X-ray studies.

Louis R. Wiley, M.D., of the same Bureau of Tuberculosis Control, was very helpful in reading and reporting our 70 mm. films.

ATOMIC ENERGY COMMISSION FELLOWSHIP TRAINING PROGRAM

The Atomic Energy Commission, through its Division of Biology and Medicine, announces a Fellowship Training Program in the field of atomic energy as applied to biology and medicine. This program includes training for doctors of medicine and will be administered for the Commission by the National Research Council. Further detailed announcements will be forthcoming in the immediate future. It is hoped that sufficient interest will be exhibited for the first group of fellows to begin training on September 1, 1948.

The fellowships will be awarded to physicians who have completed an internship or residency and will be of two years' duration. There will be a liberal stipend, consideration being given to the marital status of the fellows. Training will include formal instruction in such essential subjects as chemistry, biology, physics and mathematics, with emphasis on their application to atomic energy in medicine. After the attainment of a well rounded background in these sciences, it is anticipated that the fellows will spend the remainder of their fellowship in basic and regional clinical research at the various laboratories that are a part of the Commission and where there are unique opportunities for such endeavor. So far as possible, the fellows will be allowed a choice of their training sites and the research problems undertaken.

At the termination of such training the fellows will be free to follow careers of their own choice. However, opportunities will be available for continued employment in the medical facilities of the Atomic Energy Commission where there are active and extensive programs in atomic energy as it applies to the various phases of medicine, both fundamental and clinical.

The rapid development of atomic energy in the field of biology and medicine indicates a vast opportunity for study and development in this branch of science. The Atomic Energy Commission is anxious to further the use of atomic energy in medicine, and it is believed that a fellowship program as outlined will be valuable to all concerned.

MINNEAPOLIS ACADEMY OF MEDICINE

The regular monthly meeting of the Minneapolis Academy of Medicine was held at the Minneapolis Club on April 19, 1948. There were present 16 senior members, 24 active members, 3 associate members, 2 members elect and 10 guests.

The action of the Council concerning the publication of a special issue of the Minneapolis Academy of Medicine by The Journal-Lancet in August was discussed. It seemed to be the concensus of opinion that this was a good idea, but that the transactions of the Academy should also be published monthly in our official journal, The Journal-Lancet.

The election of Drs. H. Hoffman Groskloss and Baxter A. Smith, Jr., was announced.

The President announced that the speaker for the Annual Spring Meeting would be Mr. Edward Rogers of Walker, who will speak on "The Chippewas of Minnesota."

Dr. Karl E. Sandt read his inaugural thesis on "Early Diagnosis of Strabismus in Children." This was discussed by Drs. Walter L. Hoffman and Walter H. Fink, both of whom stressed the early examination and treatment of this condition. Dr. Sandt, having thus completed the requirements for membership, was presented with the Certificate of the Academy and admitted to active membership in the specialty of ophthalmology.

Dr. M. J. Shapiro then presented an interesting paper on the "Differential Diagnosis of Congenital Heart Disease," illustrating his talk with slides and case histories culled from his work over the past 25 years in the Heart Clinic. This was discussed by Drs. Paul Dwan and Richard Varco (by invitation). Dr. Dwan stressed the value of teamwork in the treatment of the conditions. Dr. Varco emphasized the value, from the surgeon's point of view, of the work in the experimental laboratory in the preparation of the surgeon for surgery of congenital hearts. He showed several slides and discussed the technique of the operation.

Meeting adjourned at 10:00 P.M.

H. E. Hoffert, M.D., Recorder
Charles H. McKenzie, M.D., Secretary

. . . MEET OUR CONTRIBUTORS . . .

Albert V. Stoesser, M.D., guest editor, is Associate Professor of Pediatrics, University of Minnesota; specializes in Pediatrics and Allergy; member, Board of Regents; Assistant Treasurer, American College of Allergists; has received grants for research from Mead Johnson and Co., the Borden Company, and the Markle Foundation of New York.

Ralph Bowen, M.D., Houston, Texas, is Associate Professor of Medicine, Baylor Medical School; Associate Editor, International Correspondence Letters; graduate of the University of Iowa, class of 1924; specializes in Pediatric Allergy.

Richard B. Tudor, M.D., Clinical Instructor in Pediatrics, University of Minnesota, has practiced in Minneapolis for four years; graduate of the University of Minnesota, class of 1941.

Howard H. Groskloss, M.D., Clinical Instructor in Obstetrics and Gynecology, University of Minnesota, has practiced in Minneapolis for over two years; graduate of Yale University, class of 1935; F.A.C.S.

Evelyn S. Harris, M.B., M.D., has practiced in St. Paul for four years; specializes in Pediatrics; graduate of the University of Minnesota, class of 1936.

Paul Dwan, M.D., Clinical Assistant Professor of Pediatrics, University of Minnesota; Clinical Associate Professor of Pediatrics and Director, Human Serum Laboratory, University of Minnesota; has practiced in Minneapolis for 15 years; specializes in Pediatric Cardiology; President, Minnesota Heart Association; graduate of Harvard University, class of 1928.

Neil N. Litman, M.D., is a Fellow in Pediatrics, University of Minnesota Hospitals; graduate of the University of Minnesota, class of 1944.

James F. Bosma, M.D., is Instructor in Pediatrics, University of Minnesota; graduate of the University of Michigan, class of 1941.

Lawrence F. Richdorf, M.D., Clinical Associate Professor of Pediatrics, University of Minnesota; Vice President, Minnesota Heart Association; member, Minnesota Polio Commission, Minnesota American Legion Heart Research Professorship Committee; delegate, Minnesota Medical Association; graduate of Universities of Wisconsin, B.S., 1917, and Minnesota, M.D., 1920, and Ph.D., 1925 (Pediatrics).

Lawrence H. Cady, M.D., general practitioner in Minneapolis for 25 years, is a graduate of the Univeristy of Minnesota, class of 1923.

William R. Heilig, M.B., M.D., is a Medical Fellow in Pediatrics, University of Minnesota; was graduated from this university in 1945.

Erling S. Platou, M.D., Clinical Professor of Pediatrics, University of Minnesota, has practiced in Minneapolis for 23 years; graduate of the University of Minnesota, class of 1921; member, Minnesota State Board of Health.

Theodore Smith, M.D., is a Medical Fellow in Pediatrics, University of Minnesota; graduate of the University of Oregon, class of 1944.

Harry Medovy, M.D., Winnipeg, Manitoba, Canada, is Lecturer in Pediatrics, University of Manitoba; Pediatrist, Winnipeg General Hospital; Attending Physician, Children's Hospital, Winnipeg; graduate of the University of Manitoba, class of 1928.

John L. Gedgoud, M.D., Omaha, Nebraska, is Associate Professor of Pediatrics, University of Nebraska; Fellow, A.M.A. and American Academy of Pediatrics; graduate of the University of Chicago, class of 1934.

James P. Tollman, M.D., Omaha, Nebraska, is Chairman, Department of Pathology and Bacteriology and Pathologist, University Hospital, Omaha, Nebraska; graduate of the University of Nebraska, class of 1929.

Charles H. McKenzie, M.D., is Chief of Staff, Asbury Hospital, Minneapolis; Secretary, Minneapolis Academy of Medicine; F.A.C.S., Diplomate, American Board of Obstetrics and Gynecology; graduate of the University of Alberta, class of 1927.

Edgar S. Krug, M.D., State College, Pennsylvania, is Assistant College Physician, College Health Service, Pennsylvania State College; graduate of Jefferson Medical College, Philadelphia, class of 1929.

Herbert R. Glenn, M.D., State College, Pennsylvania, is Director, College Health Service, Pennsylvania State College; graduate of Jefferson Medical College, class of 1927.

Harriot Hunter, M.D., Denver, Colorado, is Director, Medical "C" Clinic (clinic for epileptics) and Associate Director, Psychiatric Liaison Department, University of Colorado Medical Center; graduate of Johns Hopkins University, Baltimore, class of 1941.

The JOURNAL LANCET

Official Journal of the

American Student Health Association
Great Northern Railway Surgeons' Association
Minneapolis Academy of Medicine
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Editorial

OUR CHILDREN'S HEALTH

Each year the month of May is set aside for the evaluation of our children's health. Is their care keeping pace with the rapid advances in all fields of medicine? The answer is yes for much has been contributed recently to reduce suffering. Allergic diseases are more easily recognized. This is especially true of eczema, urticaria, allergic rhinitis, pollinosis and bronchial asthma. No longer need the latter produce crippling because of failure to find the proper cause. Treatment now includes an accurate diagnosis which usually leads to specific therapy, while drugs are avoided as much as possible.

Abnormal conditions due to disturbances of the endocrine glands can be better appraised with the result that many more children than ever before are offered adequate treatment. New methods for the classification of heart disease have been advanced. Children with congenital abnomalies can be placed into various groups, some of which may be treated successfully with surgical procedures. Rheumatic heart disease needs constant attention, and research in this field has already decreased the number of cases in this country. Poliomyelitis is also under continuous observation with more and more information being gathered concerning this mysterious disease.

The infant and small child with convulsions may not have a hopeless condition. They may be caused by a subdural hematoma which has been found to be quite common in the first two years of life. When treated by withdrawing the fluid, the results are usually good with no residual mental defects. The infant with cyanosis may not have a respiratory or cardiac disorder. Recent studies have shown that in the rural districts well-water can cause methemoglobinemia. This situation must not be overlooked and treatment is simple.

There are other diseases of childhood which have received attention both clinically and in the research laboratories. Mention may be made of epidemic diarrhea, fibrocystic disease of pancreas, erythroblastosis fetalis and megaloblastic anemia. The contagious diseases always are a problem. In spite of the fact that sulfonamides, penicillin and streptomycin can be added to the therapy of the past, prevention is still the best treatment. Immunization early in infancy is highly recommended. Repeated booster inoculations should be given during the preschool period.

Newer drugs and antibiotics have done much to control infection in infants and in the child, but they should be used with care. Routine therapy is condemned. Some children are made ill by sulfonamides and in others urticaria may occur after frequent use of penicillin. Must one course after another of sulfonamides or penicillin or both be given each winter with no thought as to why the illness repeats itself so many times? A complete investigation of the home life of the child combined with proper use of diagnostic methods could reduce much of this. New procedures are being worked out. Meanwhile there is plenty of evidence that all who have been interested in the welfare of our children have made contributions which stand up in front with the best in medicine. However, to receive the greatest benefit from these newer things, the current literature must be examined thoroughly with the thought in mind that proper application should be made wherever possible.

Albert V. Stoesser, M.D.

BOOKLET AVAILABLE ON CEREBRAL PALSY

Latest medical knowledge on the causes and treatment of cerebral palsy is contained in "The Problem of Cerebral Palsy Today," a brand new 57-page booklet written by Dr. Meyer A. Perlstein, one of the nation's foremost pediatricians.

Distributed by the National Society for Crippled Children and Adults, Chicago, this booklet organizes and correlates up-to-date information on cerebral palsy, and suggests some of the future needs that must be met.

Prepared with the assistance of William McPeak, prominent social science analyst, Dr. Perlstein has written this outstanding booklet as an aid to the medical profession, for leaders in community organizations, and as a guide to workers in the fields of health and rehabilitation.

The contents include a description of the problem of the cerebral palsied child, a suggested state program, professional training, research needs, and cerebral palsy as a socio-economic problem. Of special interest are sections devoted to an expanded diagrammatic chart of how a model cerebral palsy program operates, and some hypothetical case histories illustrating the mechanics of the cerebral palsy program.

Copies of the booklet can be obtained from the National Society for Crippled Children and Adults, Inc., 11 S. LaSalle Street, Chicago 3, Illinois, at 25 cents each.

"STUDIES ON SCHISTOSOMIASIS"

Previously withheld from publication for security reasons, results of research on the blood fluke infection, schistosomiasis, have been released by the U. S. Public Health Service of the Federal Security Agency in "Studies on Schistosomiasis," National Institute of Health Bulletin No. 189.

Many of the Institute's investigations into this snail-borne disease were conducted at the request of the Surgeon General of the U. S. Army. While the disease is not endemic in this country, some military personnel returning from overseas were found to be infected, mostly as a result of exposure in certain islands of the Philippines.

Major aspects of the research included: determination of whether domestic snails could serve as intermediate hosts of the three species of human schistosomiasis; if sewage and water treatment could destroy ova and miracidia, and what processes were most effective; development of ointments for chemical impregnation of fabrics against penetration of the larval cercariae; and diagnosis of the disease by serological and intradermal tests.

The 212-page "Studies on Schistosomiasis" may be purchased through the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at 50c per copy.

...NEWS ITEMS...

NORTH DAKOTA

Resignation of Dean Alfred H. Lawton of the North Dakota University school of medicine was announced April 14 by President John C. West, who said the resignation would become effective July 1. Lawton has accepted a position as chief in the department of education and research of the bureau of medicine and surgery of the veterans administration with headquarters at Washington, D. C.

The newest member of the Johnson clinic in Rugby, Dr. Pieter C. Van Leer, is a former medical officer of the Netherlands East India army, who for 3½ years was a prisoner of the Japanese.

Dr. Van Leer was reared in Amsterdam, Holland, where he received his education. He went to Java after serving as instructor in surgery at the University of Amsterdam. In 1942 he was captured by the Japanese and held prisoner until 1945.

After the release of Dr. Van Leer and his family he came to the United States and took postgraduate work in surgery at Tulane university. For a year he has been at Evanston. The family's second son was born in a Japanese prison camp.

Dr. A. D. Strom, former resident of the Landa community, who has been associated with Dr. K. P. Caveny in the practice of medicine in Langdon, has taken over the office and equipment of Dr. J. P. Bartle, who recently moved from Langdon to do research study. The two doctors will maintain separate offices for their medical practices.

Dr. Strom went to Langdon from Bottineau, having been associated in the medical practice here with Dr. J. A. Johnson following his service with the army medical corps.

A Morton county native and former NDAC graduate is achieving distinction in studying possible effects of radioactive and atomic particles on human beings at the University of Chicago.

He is Dr. Leon O. Jacobson, who at one time lived in the Sims community near New Salem.

Several eastern newspapers have publicized Dr. Jacobson's research activities and his progress in preventing damage to the blood cells by rays accompanying release of atomic energy such as that which affected survivors of the atomic bombings of Hiroshima and Nagasaki.

Dr. Jacobson said radiation damage has been prevented in experimental animals by stimulating blood-forming tissues in the bone marrow and spleen. He said this halts anemia ordinarily produced by large doses of radiation.

A Dr. A. A. Kjelland day will be observed in Hatton May 23 to honor the doctor who has served the community for 37 years.

Dr. Duane Pile of Washburn is now associated with Dr. C. O. McPhail in Crosby.

Dr. F. E. Weed observed his 36th anniversary in the Park River community in April.

An eight-room suite houses his clinic. He is frequently called upon to perform operations in neighboring hospitals. His goal now is to establish a hospital in Park River. He is a former president of the Grand Forks district medical society and is a member of the state board of medical examiners.

Medical technologists of the St. Alexius hospital, Bismarck, were hosts to the state medical technologists at an organizational meeting on April 11. There are 58 registered medical technologists in North Dakota. The North Dakota chapter will be affiliated with the American Society of Medical Technologists. Mrs. Ida Lucille Wallace of Bemidji, Minnesota, is national president.

Handicapped children from five counties and their parents were guests of the Williston Elks lodge April 12 at the annual crippled children's clinic.

The clinic brought together the offices of the state crippled children services, rehabilitation services, and social and welfare services. Twenty workers conducted the clinic under the direction of Mrs. Florence Scott, chief of the crippled children's service.

Alec Rawitscher, chairman of the Elks crippled children's committee for five counties, was in charge of the Elks' activities. The lodge donated the facilities of its home, provided dinner for children, parents, and clinic personnel, and paid for all X-ray work requested by examining physicians. Counties benefiting by the clinic are Williams, McKenzie, Divide, Burke, and Mountrail.

Examining physicians were Dr. Ralph Dyson, Minot, pediatrician; and Dr. Graham Kernwein, Minot, and Dr. Joel C. Swanson, Fargo, orthopedists. Purpose of the clinic was diagnosis and follow-up care whether it be medical, welfare, or rehabilitation. A nutritionist from the state health department also was available.

The clinic was limited to care for persons under 21 but requests for adult care were referred to the Elks committee.

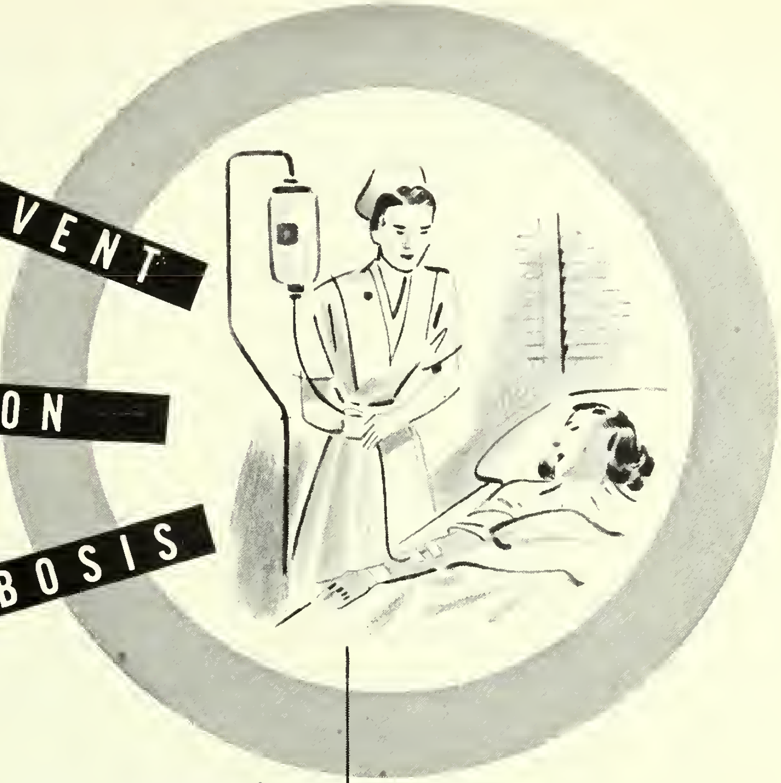
Similar clinics are held throughout the spring in other North Dakota cities under the direction of the state department of crippled children's services. A schedule of the remaining clinics is as follows: Minot, April 17; Valley City, April 24; Dickinson, May 8; Bismarck, May 10; Jamestown, May 15; Fargo, June 7; Grand Forks, June 5; Devils Lake, May 22; Rugby, May 24.

SOUTH DAKOTA

A clinic for crippled children will be conducted at the Elks club in Aberdeen on May 5, Dr. R. G. Mayer, county health officer, has announced.

Dr. J. E. VanDemark and Dr. Goldie Zimmerman, both of Sioux Falls, will conduct the clinic. The clinic

(Continued on page 214)



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*J. E. Jorpes, Heparin in the Treatment of Thrombosis, Oxford University Press, London, 1946. **P .G. C. Martin, *Brit. M. J.* 2:308, 1944.

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is for all crippled children in northern South Dakota.

The clinic is sponsored by the South Dakota Board of Health and State Elks association. Arrangements are being made by Miss Rose Nelson, county nurse, and a local Elks' crippled children's committee composed of Dr. Mayer, C. R. Erickson, Dr. A. W. Spiry of Mobridge, and Al Paetznick of Groton.

Nurses from the State Board of Health will be here to assist, Dr. Mayer said.

Other clinics will be held at Mobridge April 30, Watertown May 6, Yankton May 12, Winner May 14, Mitchell May 19, Belle Fourche May 27, and Rapid City May 28.

Dr. W. R. Peterson of Sioux Falls, chairman of the board of Methodist State Hospitals, of Mitchell has announced the election of Dr. Edward T. Gough as superintendent of the hospital.

During the past several years Dr. Gough has been superintendent of St. Luke's Methodist Hospital of Cedar Rapids, Iowa.

Dr. George G. Spellman, Woodward, Iowa, became associated with the Drs. Delaney in Mitchell in March, specializing in internal medicine.

Dr. H. Klima, Tyndall physician since 1909, has been named to the medical staff at the state hospital in Yankton.

Association of Dr. Edward T. Driscoll with the Bartron hospital in Watertown was announced in March. He is certified by the American Board of Orthopedic Surgery.

Dr. J. L. Calene of Aberdeen was named by Governor George T. Mickelson at Pierre April 5 as a member of the medical panel which will serve under the 1947 South Dakota occupational disease disability law. Dr. Calene's term will expire July 1, 1953, the Associated Press reported. The other men named by the governor to advise the industrial commissioner in administration of the law are Dr. R. B. Fleeger, Lead, whose term expires July 1, 1949, and Dr. Donald H. Breit, Sioux Falls, July 1, 1951. The panel determines the controverted medical questions on claims.

Dr. William J. Morrissey, formerly of Omaha, has joined the medical staff of Drs. S. A. Donahoe and G. I. W. Cottam, in Sioux Falls.

A South Dakota Society of Medical Technologists was organized at Mitchell the first week in April at St. Joseph's hospital, with Sister Mary Veronica, St. Luke's hospital, Aberdeen, named president of the group. Other officers include Harry Falconer, city health laboratory, Sioux Falls, vice president, and Sister Mary Mildred, St. Joseph's hospital, secretary-treasurer. Dr. J. C. Ohlmacher of the State Health laboratory in Vermillion was made an honorary member of the society.

(Continued on page 216)

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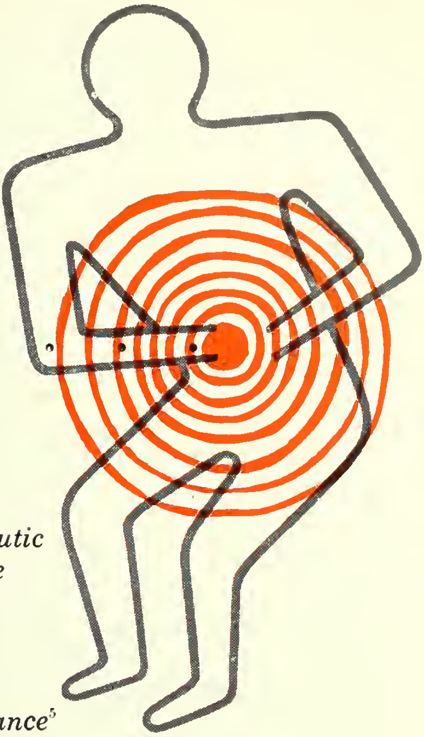

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[1] Malyoth, G.: Klin. Wchnschr. *13*:51, 1934.
[2] Bittner, J. E., Jr.: Northwest Med. *35*:445 (Dec.) 1936.
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[6] Morrison, L. M.: Am. J. Digest. Dis. *13*:196 (June) 1946.

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MINNESOTA

Dr. Claude Lewis of Fort Meade, South Dakota, has been named head of the St. Cloud Veterans hospital. He succeeds Dr. John Pringle, who has retired.

Dr. Maurice B. Visscher, head of the Physiology Department, University of Minnesota, is directing cardiovascular research under a $18,900 grant allotted the University in April. The grant was made by a group of United States and Canadian life insurance companies through a medical research fund.

The University of Minnesota Board of Regents in April recommended appointment of Dr. Jerome T. Syverton as professor and head of the Department of Bacteriology and Immunology in the medical school to succeed the late Dr. Robert G. Green.

At the same time it accepted gifts totaling $121,529, the largest of which was $75,000 from the United States public health service for cancer research.

The regents also recommended relaxing restrictions on non-resident students residing in Montana, the Dakotas, Iowa, Wisconsin and upper Michigan. To be eligible, the students must have been in the top 25 per cent of their high school graduating class.

Dr. Syverton, who was recommended for the medical school post, is a native of Courtenay, and a graduate of the University of North Dakota. He has been head of the Department of Microbiology at the Louisiana State School of Medicine, at New Orleans.

DEATHS

Dr. Alexander R. Colvin, chief of surgery at Ancker hospital, St. Paul, for more than 30 years, died March 22. Dr. Colvin retired early in 1948 after 67 years of general practice. On January 19, 1948, he was honored by members of the medical profession here for his long service. He owned and operated the first X-ray machine in St. Paul.

Dr. Claude Whiting Woodruff, 71, who practiced in Fillmore county for the past 40 years, died March 24 in Pomona, California. A resident of Chatfield since 1905, Dr. Woodruff had been active in the Fillmore-Houston-Olmsted County Medical Society.

Dr. A. E. Nichols, 83, of St. Paul, died March 20. Since 1921 he served as deputy health commissioner for St. Paul, a position he held at the time of his death.

Dr. Henry Kline, 52, of Anoka, died March 17. Widely known in medical circles, Dr. Kline was the son of the late Dr. J. F. Kline, pioneer Anoka physician who founded a sanitarium here.

Dr. Geo. B. Weiser, 90, of New Ulm, died March 23 after 67 years of practice.

Dr. E. H. Nelson, 72, retired physician and long-standing resident of Chisholm, Minnesota, died March 29. For the last eight years he had been manager of the Mesaba Clinic. His retirement became effective October 1, last year.

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PREPARATION OF MANUSCRIPTS

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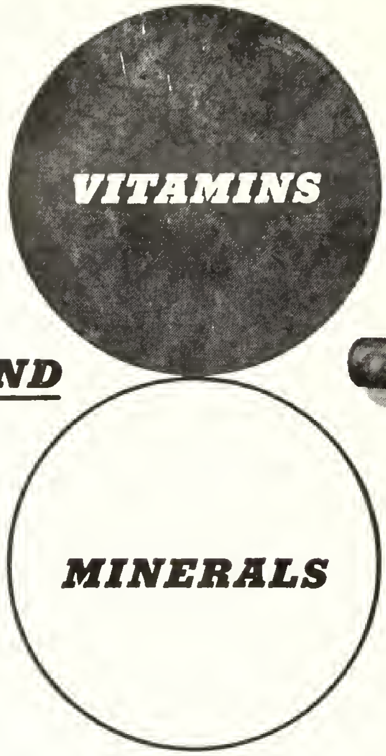

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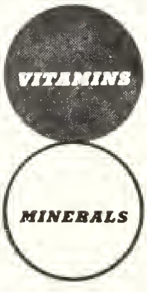

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The JOURNAL LANCET

Minneapolis, Minnesota
June, 1948

Vol. LXVIII, No. 6
New Series

The Incidence and Significance of Molds in Allergic Respiratory Symptoms

William Sawyer Eisenstadt, M.D., F.A.C.A.
Minneapolis, Minnesota

Air-borne spores of fungi were first shown to be the cause of allergic respiratory symptoms by Van Leeuwen[1] of Holland and Cadham[2] of Canada, both in 1924. In the following ten years, only isolated cases of mold allergy appeared in the literature, but these were regarded as rare instances due primarily to occupational exposures, or to special environments such as a moldy basement or a moldy mattress. Molds were still relegated to minor importance until the late 1930's, when American investigators, including Durham[3,4] and Feinberg[5] in the Midwest and Prince and Morrow[6] in the Southwest, focused our attention on the importance of fungus spores as a general atmospheric allergen.

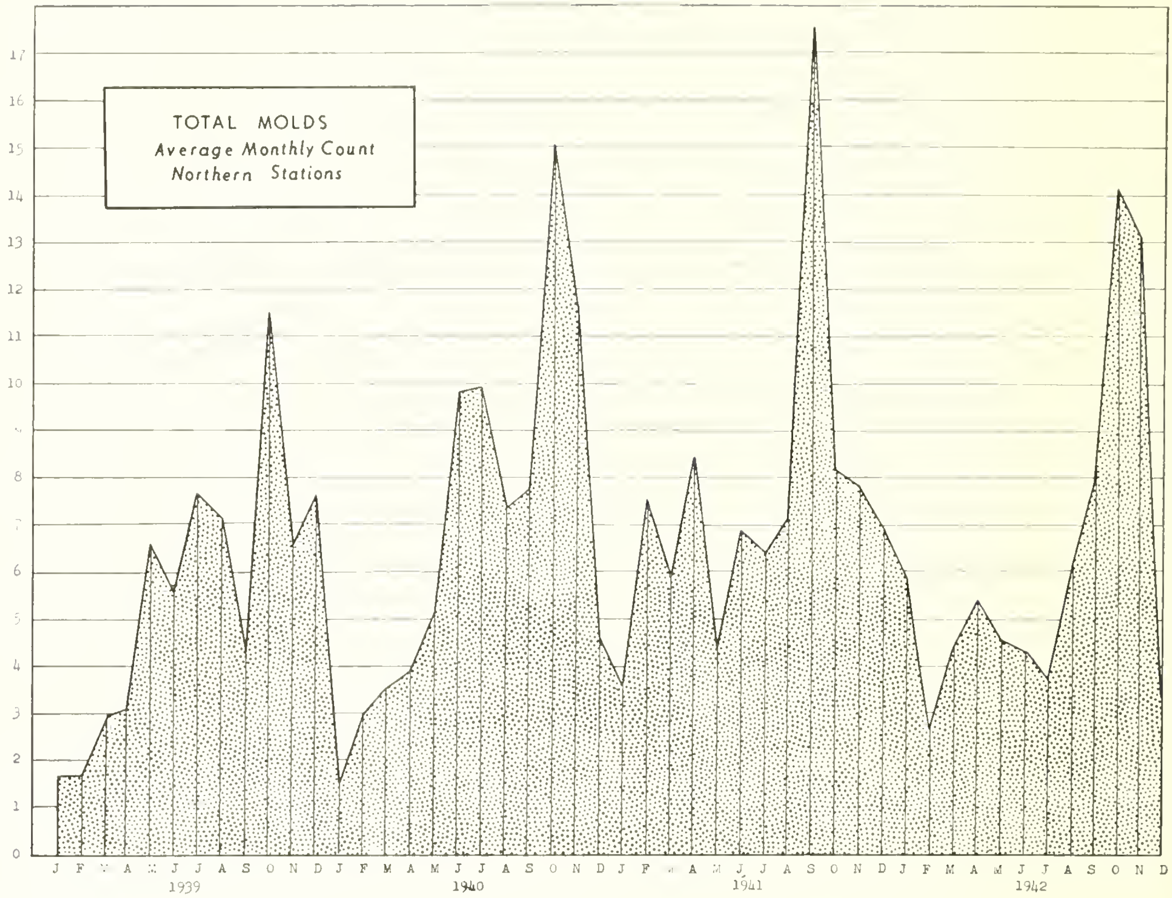
In this particular region, Wittich[7] in 1937 first called our attention to the importance of grain smuts in the production of asthma. His subsequent studies with grain smuts and grain dusts,[8,9] both in relation to primary causes of allergic respiratory symptoms and as contributory allergens during the fall hay fever season, were exceedingly important contributions. These studies revealed grain smuts to be present in abundance from July through October, with a peak incidence coinciding with the pollinating periods of the common weeds of this region.

Ellis and Rosendahl,[10] in their excellent surveys of the State of Minnesota made in the late 1930's, revealed the presence of pollens of weeds other than ragweed during the fall hay fever season. These pollens, though not nearly as abundant in the atmosphere as ragweed, were contributory factors in the production of fall hay fever. They found that multiple pollen sensitivity was present in the vast majority of patients.[11] Treatment which included extracts of these minor pollens with ragweed yielded far better results than ragweed alone. That this same relationship may exist in patients possessing both mold and pollen sensitivities will be brought out in this paper.

Air-borne surveys by Durham[3,4] and later more extensive surveys by Wittich[12] in collaboration with the Association of Allergists for Mycological Investigation have been made for the region of the Twin Cities. The results in this region paralleled the findings of various investigators throughout the northern half of the United States. Thus, any survey in any particular locality in the northern half of the United States is useful anywhere in this region. The variation as to variety and number of air-borne spores of fungi is both slight and insignificant. These surveys revealed that air-borne spores of fungi were present throughout the year, but are, however, relatively low in winter and relatively abundant in the summer. This is shown in the Graph, which is a four year study by the Association of Allergists for Mycological Investigation.

Dominant Molds

It has been shown that the dominant molds are Alternaria, Hormodendron, Helminthosporium, Aspergillus, Penicillium, Fusarium, Phoma, Spondylocladium, Mucorales, Mycogene and Pullularia. The above molds, with the exception of Aspergillus and Penicillium, although present the year around, have a definite seasonal tendency, being relatively low during the winter



months, but relatively high from April to November when the snow is off the ground. Aspergillus and Penicillium exhibit no seasonal tendency, being present in equal number the year around.

Air-borne surveys[13,14] have shown Alternaria and Hormodendron to be far more aboundant than the other molds. It has been shown that they constitute from 61 to 72 per cent of the total mold spore crop, with Alternaria comprising from 30 to 35 per cent and Hormodendron from 26 to 42 per cent. Furthermore, 90 per cent of the total crop of Alternaria and Hormodendron spores occur during the months from May through November.

TYPES OF MOLD CASES

Mold cases can be divided into three categories.

Type I. The first group includes patients whose respiratory symptoms are present only in the summer, the extent of the season varying considerably but being most often from May to October or April to November. The spread of the season depends mainly on the degree of clinical sensitivity of each individual. The least sensitive individuals have symptoms only during the height of the season, i. e., July, August, September. More sensitive patients may suffer from April to November. There is no sharp delineation as in pollen cases. The main point to be made is that symptoms do not coincide with pollen seasons. Symptoms may begin before any pollination may appear, between the tree and grass season, or between the grass and weed season; and they may not disappear until long after the air is free of pollen in the fall of the year. A history of seasonal symptoms with negative pollen tests, or positive skin tests to pollens which do not explain the entire length of the patient's season, should be regarded as suspicious of fungus allergy. Unsuccessful results with pollen therapy when doses have been adequate may be indicative of a complicating fungus allergy.

Type II. The second group includes patients whose respiratory symptoms are worse in summer but are also present to a fair degree during the winter. These cases are usually more sensitive than the first group, or are additionally sensitive to non-seasonal fungi such as Penicillium and Aspergillus.

Type III. The third group includes year around symptoms without any seasonal differences. These individuals are usually sensitive to molds such as Aspergillus and Penicillium which have very little seasonal tendency and are present in the atmosphere in equal number throughout the year. It may include a few cases of extreme sensitivity to fungi such as Alternaria and Hormodendron which have a seasonal tendency, but are present in lesser quantities during the winter months. Environmental or occupational types such as furniture repairers, vegetable workers and farmers belong to this group.

METHODS OF TESTING

In this study the following extracts were used in testing: Alternaria, Aspergillus Niger, Aspergillus Fumigatus, Helminthosporium, Hormodendron, Mucor, Penicillium, Phoma. An attempt was made to test routinely every patient with allergic respiratory symptoms. Early in the study seasonal hay fever cases were not tested with molds. Somewhat later, these seasonal cases were tested with only Alternaria and Hormodendron. When our attention was called to the relative importance of molds, all cases, both seasonal and perennial were tested with all eight molds. Testing was done with a 1-1000 dilution. A 1-100,000 dilution elicited too few positive reactions, while a 1-100 dilution was irritating, yielding many false positive reactions. All tests were performed intradermally. On two occasions, constitutional reactions were encountered in testing, both with Alternaria.

TABLE 1
Patients Tested with Mold Extract

380 Cases Tested	
Tested with 8 Molds	Tested with 2 Molds
246 (65%)	124 (35%)

Three hundred eighty cases of respiratory allergy were tested with mold extract (Table 1). Of these, 246, or 65 per cent, were tested with all eight molds; 124, or 35 per cent, were tested with two molds, Alternaria and Hormodendron; 129, or 34 per cent of all cases tested, showed positive reactions. It was thought early in our study that in view of testing only 65 per cent of the group with all eight molds, the incidence of positive reactions would be lower than if all were tested with the eight molds. However, this was not found to be true, as the incidence of positive reactions in the patients tested with all eight molds was 36 per cent and the group tested with only the two predominant molds (Alternaria and Hormodendron) showed an incidence of 33 per cent, a difference which is statistically insignificant (Table 2).

TABLE 2
Results of Skin Testing

	No.	Percent
Cases positive to molds	129	34
Cases positive when tested with 8 molds (Group I)	88	36
Cases positive when tested with 2 molds (Group II)	41	33

Feinberg,[15] in a series of 638 allergic patients, found positive reactions to fungi in 261, or 40.9 per cent. He felt this was a selective group and that a truer figure would be nearer 20 per cent. Sellers and McKenzie [16] found 44 per cent of 392 patients with inhalent allergy sensitive to molds. In a series of 705 patients, Zink [17] found 58 per cent of patients with allergic respiratory symptoms positive to one or more molds.

TABLE 3
Skin Reactions to Molds

Molds	Group I (8 molds)		Group II (2 molds)		Combined (I and II)	
	No.	Pct.	No.	Pct.	No.	Pct.
Alternaria	59	67	34	83	93	72
Hormodendron	40	45	15	37	55	43
Helminthosporium	39	44				
Phoma	27	31				
Mucor	34	27				
Penicillium	15	17				
Aspergillus F.	13	15				
Aspergillus N.	13	15				

RESULTS OF SKIN TESTING

Table 3 shows the result of skin testing. For Alternaria and Hormodendron the results are placed in two categories: those tested with all eight molds (Group I) and those patients tested with only two molds, i. e., Alternaria and Hormodendron (Group II). In all, 93 patients, or 72 per cent, reacted to Alternaria. Breaking these figures down in Group I, 59 patients (67 per cent) showed positive reactions to Alternaria, while in Group II, 34 patients (83 per cent) reacted to Alternaria. Similarly in the combined groups, 55 patients (43 per cent) showed positive reactions to Hormodendron. In Group I, 40 patients (45 per cent) reacted to Hormodendron, while in Group II, 15 patients (37 per cent) showed positive reactions to Hormodendron. The results for the remainder of the molds in Group I are as follows: Helminthosporium 39 (44 per cent), Phoma 27 (31 per cent), Mucor 24 (27 per cent), Penicillium 15 (17 per cent), Aspergillus Fumigatus 13 (15 per cent), Aspergillus Niger 13 (15 per cent).

The results of skin testing parallel to a great degree the relative abundance of the atmospheric molds. The above figures show that the reactions to Helminthosporium comprised 44 per cent of the reactors to molds. However, this relatively high figure is probably due to its close antigenic relationship to Alternaria and not to its relative abundance in the atmosphere.

It was found that multiple sensitivity is generally present. In Group I, 62 patients, or 70 per cent, were sensitive to two or more molds. A breakdown of the positive reactions in Group I reveals: 26 (30 per cent) reacted to one mold, 23 (26 per cent) to two molds, 15 (17 per cent) to three molds, 15 (17 per cent) to four molds, 5 (6 per cent) to five molds, 3 (3 per cent) to six molds, none to seven molds, and 1 (1 per cent) to all eight molds. In Table 4 it is shown that 26, or 30 per cent, were sensitive to one mold only and that 62, or 70 per cent, of the patients sensitive to molds were sensitive to two or more molds. Group II shows 31 (76 per cent) sensitive to one mold and 10 (14 per cent) sensitive to two molds. One cannot draw any conclusions as to multiple sensitivity with Group II, since only two molds were used in testing.

The age of patients who manifested mold sensitivity ranged from 2 to 64 years of age (Table 5). One hun-

TABLE 4

Multiplicity of Reactions (Group I)

	No.	Percent
Positive to 1 mold	26	30
Positive to 2 molds	23	26
Positive to 3 molds	15	17
Positive to 4 molds	15	17
Positive to 5 molds	5	6
Positive to 6 molds	3	3
Positive to 7 molds	0	0
Positive to 8 molds	1	1

dred sixteen, or 90 per cent of all cases, were in the 1 to 40 year age group; 78, or 61 per cent (two-thirds of the cases) were in the 11 to 30 year span. This is what one would expect to find in patients exhibiting pollen sensitivity.

TABLE 5

Age Incidence (Groups I and II)

	No.	Percent
0 to 10 years	21	16
11 to 20 years	47	37
21 to 30 years	31	24
31 to 40 years	17	13
41 to 50 years	7	6
51 to 60 years	4	3
61 to 70 years	2	1

Evaluating the clinical significance of positive reactions, whether to pollens, inhalants, or molds is exceedingly difficult. This requires close scrutiny of each individual case. The following factors were considered: (1) the detailed history of the occurrence of patient's symptoms, (2) the presence or absence of accompanying pollen, inhalant or food sensitivities, (3) the absence of correlation of symptoms with pollination periods of environmental pollens, (4) the correlation of symptoms with the mold spore content in the air, and (5) the success or failure of previous adequate treatment both with or without the inclusion of mold extracts.

POSITIVE REACTION GROUPS

We have found that clinical evaluation will divide skin positive reactions to molds into three groups. Group I includes molds as the major or primary cause of respiratory symptoms, Group II includes molds as a contributory cause, and Group III includes patients in which the skin reactions have no clinical significance. Table 6 reveals 42 patients, or 33 per cent, in which molds were the primary allergen causing symptoms, 69 patients, or 53 per cent, in which molds acted as a contributory cause, and 18 patients, or 14 per cent, in which the skin reactions were of no clinical significance.

TABLE 6

Relative Importance of Skin Reactions to Molds

	No.	Percent
Primary cause of symptoms	42	33
Contributory cause of symptoms	69	53
No clinical significance	18	14

These figures are very revealing in that 11 per cent, or approximately one out of ten patients with clinical allergic respiratory symptoms, have molds as a primary cause, or in other words are essentially mold cases. We believe this figure is very significant and it behooves all of us who are treating allergic respiratory symptoms to include molds routinely in our testing. Otherwise, in a significant number of patients, 11 per cent, the cause of symptoms will not be uncovered.

If we include those cases in which the molds are contributory allergens, we find that in 29 per cent of all clinical allergic respiratory symptoms mold sensitivity is a factor. Zink,[17] in a series of 705 patients with allergic respiratory symptoms, has reported that molds were clinically important in 26 per cent, approximately the same figure we found.

An interesting factor in the group in which molds were the primary cause revealed 12 cases, or 38 per cent in which skin tests to pollens were negative. This group included patients with perennial symptoms, with accentuated symptoms in the summer, and patients whose symptoms were limited to the summer months only. Thus, in every case of allergic respiratory symptoms in the summer months, with negative pollen tests, molds should be suspected as the cause of symptoms.

The significance of molds as a contributory cause of symptoms is not to be dismissed lightly in cases in which pollen is the primary allergen. As Ellis [11] has previously shown with minor pollens in relation to ragweed and as Wittich [8] has shown the significance of grain smuts as a contributory cause in relation to ragweed pollen symptoms, so too, the addition of mold therapy may mean the success or failure of fall hay fever treatment. We feel that the abundance of air-borne spores of fungi during the pollinating period of ragweed and other fall pollens, the exacerbation of symptoms during days with low pollen counts, or otherwise unaccountable exacerbations during the fall pollen season, along with previous failure in the treatment of fall hay fever with adequate pollen dosage, justify the inclusion of molds in the treatment of fall hay fever in those patients showing sensitivity to molds.

We feel that the above figures are of enough significance to warrant mold investigation in every patient suspected of respiratory allergy.

SUMMARY

1. The importance of air-borne spores of fungi as a cause of clinical respiratory symptoms in this region is significant.

2. In a series of 380 consecutive cases of clinical respiratory allergy, 129, or 34 per cent, revealed positive skin reactions to molds.

3. Molds were clinically significant in 111, or 29 per cent, of all patients tested.

4. Molds were the primary cause of respiratory allergy of 42 patients, or 11 per cent, in the above series.

5. Alternaria and Hormodendron were shown to be of major importance, both in relation to abundance of spores and frequency of skin reactions.

6. Other molds have been shown to be clinically significant.

7. Mold extracts should be included in the routine testing of patients with allergic respiratory symptoms.

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INSTITUTE FOR STUDY OF INTESTINAL PARASITES PROPOSED

The creation of an international institute for the study of human intestinal parasites was proposed at the Fourth International Congresses on Tropical Medicine and Malaria, Washington, D. C., on May 10 by Dr. Enrique Beltran of the Institute of Health and Tropical Diseases of Mexico. In his paper, which was presented before the Section on Protozoan Diseases, Dr. Beltran stated that it was difficult, if not impossible, to compare the results obtained in surveys of amœbic dysentery carried out by different workers in different countries of the world. The most important factor in preventing any comparison was the variation in the laboratory methods used. Differences in age, sex, and racial composition, as well as in economic levels of the groups surveyed, were also found to be important. Until uniform survey methods are adopted, Dr. Beltran felt it would be difficult to determine the exact prevalence of amœbic dysentery in any one country, and impossible to determine its relative importance among the different countries where surveys have been carried out.

Standardization of laboratory methods employed in the detection of intestinal parasites would overcome some of these difficulties and could be achieved, Dr. Beltran felt, by the ceration of an institute, patterned after the International Salmonellosis Center, which has been in successful operation in Copenhagen for many years. In addition to setting up standard procedures which could be adopted by workers in all countries, such an institute could carry out valuable research work on the intestinal parasitic diseases that are important public health problems in most of the world.

Report of 26 Cases of Erythroblastosis Fetalis and Survey of the Literature

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The typical picture of erythroblastosis in its true form (anemia, jaundice, and hydrops) is well known, but no satisfactory explanation of the pathogenesis of the disease process came forth until Phillip Levine [1] discovered in his work on rabbits, that 0.067 cc. of Rhesus red cells was sufficient to sensitize an animal during its pregnancy. He concluded that this must approximate the minimal quantity necessary to sensitize the animal as a result of escape of red cells through the placental villi. He postulated that such a phenomenon could occur in the human being and that a very small amount of blood could produce the findings seen in erythroblastosis fetalis. This theory stimulated a great deal of work to be done by Diamond,[2] Wiener,[3] Davidsohn,[4] Race and others who were able to correlate clinical and pathological data with laboratory tests to show that erythroblastosis results most often from sensitization of an Rh negative mother to her Rh positive fetus. Although most workers feel that some break or separation of the placenta [1,3,6,7] is needed, others have shown that actual placental "breaks" are not necessary for red cells to enter the maternal circulation and act as antigens.

FACTORS

In a series of 22,700 births at the Chicago Lying-in Hospital [5] it was found that one in every 252 births resulted in an erythroblastotic infant and one in 392 births resulted in a fatal case of erythroblastosis. Of the infants of Rh negative mothers, one in 37 developed or showed signs of erythroblastosis, and one in 56 died of erythroblastosis. Of all Rh negative women bearing children, one in 42 had an erythroblastotic baby in the first pregnancy, and one in 12 had a fatal erythroblastotic baby by the fifth pregnancy. This would indicate that the susceptibility to Rh sensitization varies a great deal, and is dependent upon several factors:

1. An inherent or constitutional factor referred to as "K".[3] A person possessing KK (only 2 per cent) or homozygous K factor is believed to be the most susceptible, the person with Kk the next, and a person with kk the least susceptible.

2. The antigenic properties of Rh positive blood vary with the strength of their respective agglutinogens. The blood factors arranged in the descending order of antigenic strength are[3,5]: Rh_0, Rh', and Rh". Various combinations of the basic three Rh types can produce bloods of highly variable degrees of sensitization. This fact helps to make prediction of an outcome in a given case of erythroblastosis difficult if not, in some cases, impossible.

3. The ease of passage of antigen through the placental barrier. The variation of susceptibility to sensitization and the antigenic strength of the fetus' red blood cells may be the explanation for the cases of erythroblastosis in the first pregnancy of some women and the absence of all signs in other women. Sensitization may never be discovered in the latter unless routine titers are performed.

About 10 per cent of all cases of erythroblastosis cannot be explained by Rh_0 incompatibility. These are usually found to be due to subtypes (Rh', Rh", etc.), A-B-O and Hr incompatibilities. Only if the fetus is Rh negative and Landsteiner "O" can an almost certain absence of sensitization be predicted. More recently, however, cases of erythroblastosis are reported in the literature caused by sensitization of a mother to the Hr factor either in the blood of her fetus or in the blood of a donor used for transfusions. More work has yet to be done before a clear understanding of this incompatibility is achieved. The relative infrequency of A-B-O sensitization is at present explained on the basis of large molecular size and neutralization of anti A or B agglutinins by A or B substance in the tissues. The low sensitivity produced by A-B-O accounts for a lesser degree of morbidity.

GENETICS

The genetic representation of the Rh blood factors may be achieved as follows[7]:

1. According to the three gene pattern theory, there are three genes inherited from the father and three from the mother.
2. Genetically, the position on the chromosome is assigned to one factor and its corresponding gene. For example, the Rh' factor is supposedly represented by the C gene, the Rh_0 factor is represented by the D gene, and Rh" factor by the E gene. These produce Rh positive blood types.
3. In the absence of the Rh positive factor there is a corresponding Hr factor and its representative gene, i. e., Hr' and gene c, Hr_0 and gene d, and Hr" and gene e. These are responsible for the Rh negative blood groups.
4. Graphically then, a pattern somewhat like the one given in Fig. 1 is used to represent the chromosome containing all the Rh and Hr factors.

Antibodies can be produced for the six antigens (Rh_0, Rh', Rh", Hr_0, Hr', Hr") and serums containing these antibodies are used for classification of the different Rh and Hr types. In general practice Rh_0 is generally used, but as seen in Figure 2, using only the Rh types and subtypes, eight combinations can occur.

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When Hr serums become more easily available then a much larger number of types will be determined. This makes it desirable that a central laboratory be available so that errors of classification of the unusual types, because of inadequate materials, be avoided.

Serum Tests

The basic principles governing the agglutination reactions used to demonstrate or predict potential erythroblastic infants are described in the subsequent paragraphs.

The agglutination test[2,6,8] is the addition of maternal serum to known Rh positive washed red blood cells in a saline medium. A positive reaction (clumping) indicates the presence of agglutinating bivalent antibodies. If sufficient univalent (blocking or hyperimmune) antibodies[3] are present they will be absorbed in a large enough proportion to coat the positive cells and prevent the agglutinating antibodies from causing this "clumping" reaction. A negative saline agglutination test (clumping) may therefore not only fail to diagnose sensitization, but may even mean, in the presence of blocking antibodies, a more severe degree of sensitization.

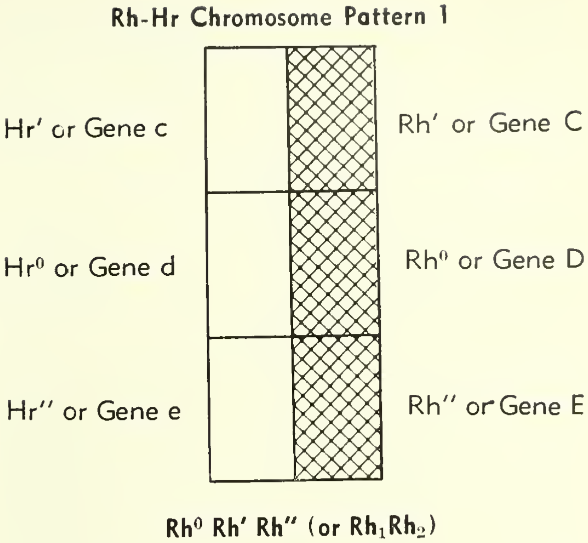

Fig. 1.

POTENTIAL COMBINATIONS OF TYPES

Serum antibodies								
Rh_0	+	O	O	+	+	O	+	O
Rh'	O	+	O	+	+	+	O	O
Rh''	O	O	+	+	O	+	+	O
Types	Rh_0	Rh'	Rh''	Rh_1 Rh_2	Rh_1	Rh' Rh''	Rh^2	rh

Fig. 2

A second, or "conglutination" test,[10] in which AB plasma or bovine albumin is used instead of saline, differs from the agglutination test merely in the avoidance of a crystalloid solution for dilution. This test is employed for the purpose of demonstrating the presence of "blocking" (univalent) antibodies. It consists of adding maternal serum (containing suspected blocking antibodies) to Rh positive cells suspended in AB plasma or bovine albumin. After a suitable period of incubation conglutination should occur if blocking antibody is present. The reaction is illustrated according to Wiener's theory in Figure 3.[9,11] Agglutination and conglutination tests when performed with the washings from the red blood cells of the erythroblastotic infant are almost universally negative.

Demonstration of the presence of blocking antibodies absorbed on the surface of the fetal red blood cells (Coombe's test) could be valuable in prognosis and as an added criterion for exchange transfusions. A positive test (on fetal red cells) is almost diagnostic of a serious form of erythroblastosis fetalis but a negative test cannot be relied upon, as Coombes[19] has reported it positive in only 40 per cent of even fatal cases of erythroblastosis fetalis.

Agglutination and conglutination tests should be done periodically during the pregnancy because although anti-

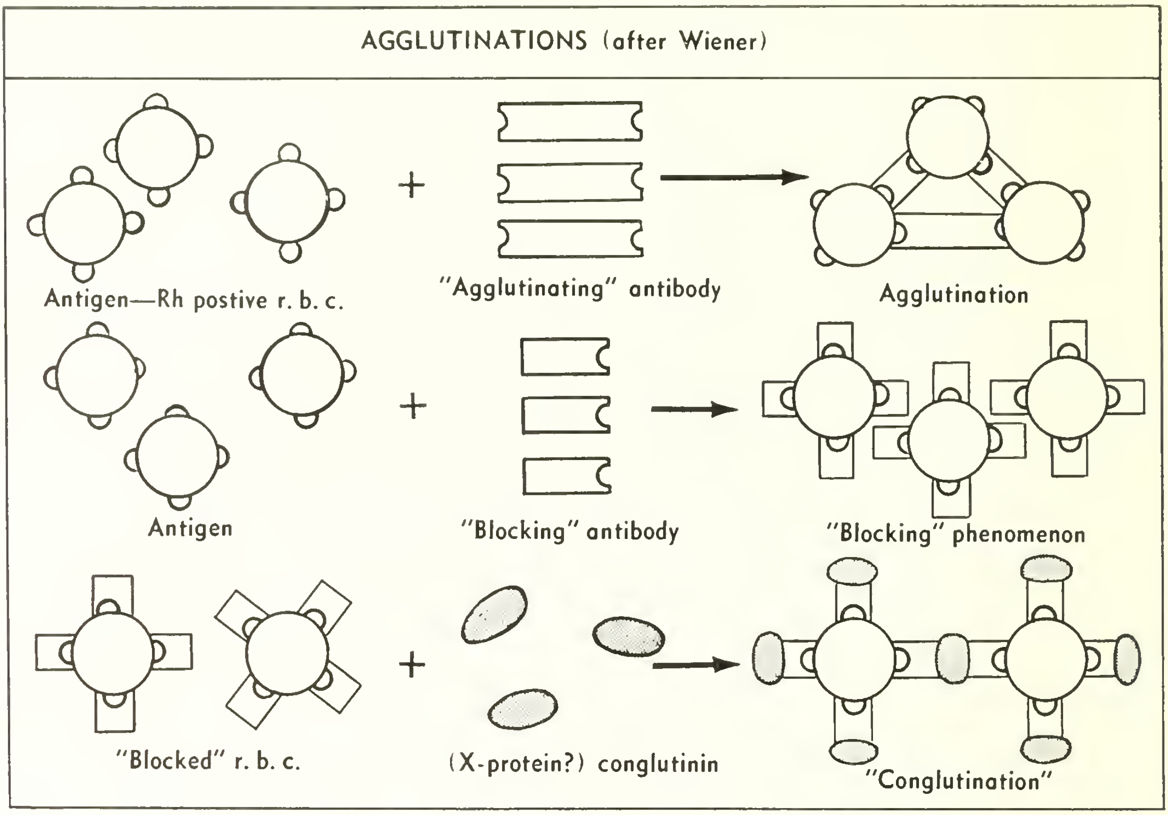

Fig. 3

bodies are usually not formed until the latter few months of pregnancy there are some cases of sensitization resulting from previous administration of incompatible Rh or Hr blood to the mother.[1,5,3] Determination of a serious prognosis for the fetus is made not so much on the height or time of appearance of the titer of anti-Rh antibodies in the maternal serum but by the rapidity of the rise of the titer. Maternal antibodies usually reach a maximum about ten to twenty-one days[1c] post partum, presumably as the result of the exchange of a large amount of fetal and maternal blood at the time of placental separation and expulsion when a large kneading force is applied to the placental villi.[1,3,5] At this time there also occurs a rapid increase of antibody content in the breast milk. These antibodies may persist in maternal serum from a few weeks to several years.

PATHOLOGY

Early reports seemed to indicate that anemia and hydrops universalis were associated with blocking antibodies, and that jaundiced cases were associated with agglutinating antibodies. Larger series have now shown that no constant correlation exists. The principal pathologic factors governing the outcome of a given pregnancy seem to be: (1) the degree of prenatal liver and/or brain damage; (2) the rapidity or magnitude of the intravascular agglutination or hemolysis which occurs within the first 12 to 24 hours after birth; (3) the presence of an additional complement-like factor called by Wiener "X-protein",[3] which seems to accentuate postnatal changes in the fetus.

Davidsohn [4] and Potter [5] have demonstrated that survival from erythroblastosis fetalis depends most upon the degree of liver damage. Isohemolysis and isoagglutination bring about (1) anoxemia and endothelial damage; (2) extramedullary hematopoiesis with circulatory impairment; (3) intrahepatic biliary stasis with severe obstructive jaundice causing in certain cases: (a) hypoproteinemia and edema, (b) hypoprothrombinemia and hemorrhage, (c) severe hemolytic anemia.

In most cases where kernicterus, or yellow staining of the basal nuclei of the brain occurs, evidence at hand indicates that this condition may take place before or shortly after the anticipated date of delivery.[13,14] Examination of erythroblastotic stillborns confirms this belief. A high proportion of fatal cases of erythroblastosis fetalis show kernicterus, and in severe cases which survive, it is not unusual to find spasticity [1c,13,14,15,16] and cerebral deficiencies. Two theories of the origin of kernicterus are: (1) intravascular agglutination with cerebral anoxia and (2) toxic, anoxic changes followed by pigment deposition.

CLINICAL DATA

The clinical features of our 26 cases can best be portrayed by the following summary:

Total number of cases of erythroblastosis	26
Total number of cases surviving	20

Number of cases treated by exchange transfusion	12
Cases jaundiced clinically within 24 hours post partum	20
Cases with anemia only	4
Cases with hydrops fetalis	2
Cases with hydrops living (hemiplegia)	1
Kernicterus (clinical and postmortem)	6
Kernicterus with fatality	4
Cases with hemoglobin below 10 gm.% at birth	11
Normoblast count above 20 per 100 WBC at birth	15

These cases will be dealt with in three groups which tend to illustrate the course of development of present therapy. Group I includes those that received Rh positive whole blood transfusions only; Group II, those cases that received Rh positive whole blood, Rh negative whole blood, and Rh negative washed red blood cell transfusions; and Group III, those that received exchange transfusions of Rh negative whole blood. Exchange transfusion results in the removal of antibody from the baby's blood and the replacement of the baby's Rh positive cells by Rh negative cells. That this can be accomplished has actually been demonstrated.

Group I. Three infants with other siblings who died of erythroblastosis, multiparous mothers, and incompatible parental Rh blood types, developed the clinical picture of erythroblastosis and were treated with Rh positive blood transfusions. No facilities were available at that time to give estimates of the prenatal sensitivity of the mothers of these infants. All three had severe courses with extreme jaundice, hepatosplenomegaly, anemia, and stupor. One infant survived after several weeks; one died during therapy with anemia and marked jaundice; and one lived but sustained a hemiplegia (hydrops). Postmortem examination of the fatal case showed marked hepatic and brain damage. The death of this case may be attributed to one or all of three factors: (1) the hemolysis and hemagglutination in the infant's blood; (2) irreversible toxic and anoxic changes; and (3) the addition of the Rh positive blood to the infant's circulation which did not change the amount of total circulating antibody in sufficient quantity to prevent the progressive antigen-antibody reaction.

Group II. In this group of eleven infants three were treated by Rh positive whole blood transfusions followed by Rh negative whole blood transfusions; six were transfused with Rh negative type "O" blood; and two were given Rh negative type "O" washed red blood cells only.

The first three cases were given Rh positive blood as soon as the diagnosis of erythroblastosis was made. All had severe maternal histories, anemia at or soon after birth, jaundice, lethargy, and general signs of early shock. While using Rh positive blood all went steadily downhill. Rh negative type "O" blood was then employed and there was noticeable improvement in all three cases soon after. This would seem to suggest that Rh positive blood transfusions in severe or moderately severe cases actually increased the morbidity.

Six cases were treated with Rh negative type "O" blood who had severe maternal histories, jaundice, listlessness, and hepatosplenomegaly. Despite repeated transfusions with Rh negative type "O" blood, three cases died with typical pathologic findings of erythroblastosis fetalis. The other three survived with no apparent sequelae. In the fatal three cases, therapy did not prevent or effectively minimize the damage done in the first 24 to 36 hours. Lack of specific anti-sera at that time makes a comparison of the severity between the fatal and non-fatal cases difficult.

Two cases with severe maternal histories, high maternal anti-Rh antibody titers, multiparity of the mothers, and clinical and laboratory tests corroborative of the diagnosis of erythroblastosis were treated by Rh negative type "O" washed red blood cells. One child was not treated until she was almost 48 hours old and she died at the age of three days with typical autopsy findings of erythroblastosis and kernicterus. It is impossible to predict how this case may have responded to some other type of therapy.

Group III. This group includes twelve cases who received exchange transfusions of Rh negative whole blood. These cases are summarized in the Table. There were two deaths in this series. Both were two months premature infants born by cesarean sections. At that time, in the judgment of the obstetrician, it was deemed wise because of the progressive and alarming rise of maternal antibody titer and a severe maternal history. At the present time it is unlikely, in view of reported results and our own experience, that we would undertake such a course of action. To date, the other ten cases (two one-month premature) show no sequelae except one of the full term infants who has a residual hemiplegia.

Prediction of the Need of Exchange Transfusion

Exchange transfusions are decided upon after evaluation of the following criteria:

1. History of lost babies after the sixth month of pregnancy
2. Multiparity of mother
3. Rise in maternal and anti-Rh antibody titer
4. Jaundice of the newborn in the first 24 hours of life
5. Fetal normoblast count over 20 per 100 WBC in the first 24 hours of life
6. Hepatosplenomegaly at or soon after birth
7. Elevated serum bilirubin at or soon after birth.
8. Antibodies in the fetal serum (conglutination test) or attached to fetal red blood cells (demonstration test of Coombes and Hill)

Clinical evaluation of each case with regard to the severity and number of the above factors which are present must be made if one is to determine which infants will most likely need exchange transfusion. It is essential that the transfusion be instituted within the first few hours of life, since it is at this time that the destructive processes may be at a minimum. The success of the treatment may be ascribed in large measure to the early removal of a large proportion of the anti-Rh antibodies before irreversible liver, brain, and visceral damage has occurred. By doing differential agglutination tests after exchange transfusion, the authors were able to show that over 90 per cent of the Rh positive cells had been removed, thus indicating that an equivalent amount of the infant's blood had been replaced.

EXCHANGE TRANSFUSIONS WITH RH NEGATIVE BLOOD

Case No.	Severity of Maternal History	Babies Dead of E.F.	Babies Alive with E.F.	Multiparity	Jaundice First 24 Hours	Normoblast Count per 100 WBC	Coombes	Maternal Agglut. Tests	Results
1. (1947)	pos.	2	0	pos.	0	9	N.D.	Cong.: pos. Blkg.: pos.	Recov.
2. (1947)	pos.	3	pos.	pos.	pos.	22	N.D.	Cong.: pos. Blkg.: neg.	Recov.
3. (1947)	pos.	0	pos.	pos.	pos.	154	N.D.	Cong.: pos. Blkg.: pos.	Recov.
4. (1947)	pos.	2	0	pos.	pos.	20	N.D.	Cong.: pos. Blkg.: pos.	Recov.
5. (1947)	pos.	1	0	pos.	pos.	Over 20	N.D.	Cong.: ? Blkg.: ?	Recov.
6. (1947)	pos.	1	0	pos.	pos.	11	N.D.	Cong.: ? Blkg.: ?	Died
7. (1947)	pos.	2	0	pos.	Anemia	20	neg.	Cong.: neg. Blkg.: neg.	Died
8. (1947)	pos.	1	1	pos.	pos.	20	N.D.	Cong.: pos. Blkg.: pos.	Recov.
9. (1947)	pos.	?	?	pos.	pos.	20	N.D.	Cong.: pos. Blkg.: pos.	Recov.
10. (1947)	pos.	?	?	pos.	pos.	20	N.D.	Cong.: pos. Blkg.: pos.	Recov.
11. (1947)	pos.	1	?	pos.	pos.	Over 20	N.D.	Cong.: pos. Blkg.: neg.	Recov.
12. (1947)	pos.	1	?	pos.	pos.	Over 20	N.D.	Cong.: pos. Blkg.: neg.	Recov.

Blkg. = Blocking test in saline. Cong. = Conglutination test in albumen. N.D. = Not done.

Caution must be exercised in the determination of which cases are to receive exchange transfusions as some risk is present and not all cases are severe enough to warrant this procedure. As we have no definite standard as yet to determine which cases will die in spite of therapy, those cases who reasonably fulfill the criteria already listed should receive the benefit of an exchange transfusion.

CONCLUSIONS

Analysis of our 26 cases would seem to indicate that:

1. Abandoning the use of Rh positive blood transfusions has resulted in improved morbidity and mortality.
2. While in some cases babies given Rh positive blood survived, the majority of them did better with Rh negative blood; and
3. While many babies with erythroblastosis do not require exchange transfusion, a selected group with severe maternal histories and early jaundice were strikingly improved by this procedure, whereas very similar cases treated by periodic transfusions resulted fatally.

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Editorial, J.A.M.A. 136:3 (Jan. 17) 1948.

IMPORTANT ADVANCES IN THE KNOWLEDGE OF TUBERCULOSIS

Summarized by Dr. Esmond R. Long*

Progress has been made in our understanding of the *tubercle bacillus,* which causes the disease. This germ has always been notoriously difficult to cultivate. A new liquid mixture, recently devised by Dr. R. J. Dubos of the Rockefeller Institute, contains a wetting agent and other substances which have made it possible to grow the bacillus in the large quantities desired by experimenters. The Dubos method will make it easier for bacteriologists to compare different strains of the tubercle bacillus and to study their characteristics. It will also permit chemists to determine the actual composition of the bacillus and of various substances produced by it.

Progress has also been registered, according to Dr. Long, in researches on natural resistance to tuberculosis. He called attention especially to the work of Dr. M. B. Lurie, also of the Henry Phipps Institute, who has performed a long series of experiments on the progress of tuberculosis in groups of highly inbred rabbits. It was found that the traits of resistance or susceptibility to the disease could be maintained in successive generations of rabbits by appropriate breeding, somewhat in the same way as other traits are maintained in common domestic aniamls by breeding methods.

Among the most important advances summarized by Dr. Long were those which deal with the spread of tuberculosis. Mass X-ray studies have shown that pulmonary tuberculosis is at least twice as common as had been believed previously. It used to be thought that for each tuberculosis death there were ten living tuberculosis cases. Mass X-ray surveys have brought to light many mild cases, and it is now believed that each tuberculosis death may be paralleled by twenty living cases of the disease. Observation of mild cases has brought specialists to recognize that such cases heal much more readily than was previously thought.

Two decades ago clinicians believed that tuberculosis of the lungs rarely made its debut in a person who had passed the age of 40. With increased use of X-ray examination it is now known that such cases occur and are not very rare.

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*Director of the Henry Phipps Institute in Philadelphia, in an address delivered before the fourth International Congresses on Tropical Medicine and Malaria, Washington, D. C., May 10th.

The Heart in the Athlete*

I. Comparison of Actual and Predicted Cardiac and Aortic Measurements-- Analysis of Measurements of Cardiac and Supracardiac Shadows

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The effect of athletics on the heart has been a controversial question for some time. The literature is far from decisive.[1-10] Yet, it seems important to obtain an answer. The term "athlete's heart" is still in use at least in some quarters. Some mothers still hesitantly, if at all, give their consent to children desiring to enter competitive sports.

This question is not one which is going to find a simple solution. For example, observations over a limited number of years in a group participating in one sport will do very little toward the resolution of this problem. One method calculated to shed some light upon this subject concerns itself with the study of athletes of all ages and specialties. This method also takes into account the athlete of many years ago, in order that his findings may be compared to known statistical data obtained in non-athletic groups. In the latter instance, it must be admitted that the observations will have no determinative influence, but will merely suggest trends.

This method was put into operation by a committee composed of leaders in the field of physical education cooperating with a group of interested physicians. The physical educators arranged for the procurement of subjects. At this writing, 196 athletes have been processed, among them a number of champions.

This report deals with the results obtained in comparing actual and predicted cardiac and aortic measurements.

METHOD

196 athletes have been examined. 26 are females and 170 are males. The procedure of study includes the following: a detailed athletic and medical history, a complete physical examination, functional heart test (employing the Wolffe dynomometer[11]), vital capacity determination, six foot chest plate and electrocardiogram.

Transverse cardiac diameters, frontal heart areas, and aortic diameters were estimated from the six foot chest films. Aortic diameters are spoken of because this appears to be standard usage, but actually we are measuring supracardiac shadows. These calculations were compared to predicted measurements employing the nomogram method of Ungerleider and Gubner.[12]

Deviations of between plus 10 per cent and minus 10 per cent were considered within normal range of variation.

These subjects were classified according to the strenuousness of the sports in which they engaged, as follows:*

Class A includes the most strenuous activities; Class B somewhat less strenuous activities, and so on. Obviously, all kinds of combinations are possible, and a number of other factors must be considered in classifying the athletes.

Class A. Rowing, Water Polo, Wrestling, Boxing, Basketball.

Class B. Ice Hockey, Football, Soccer, Field Hockey (Girls), LaCrosse, Cross Country, Mile Run, Track (100-880 yard runs), Hurdles, Handball, Speed Skating.

Class C. Squash, Tennis, Swimming, Baseball, Gymnastics, Weight Lifting, Skiing, Field Events (Jumps only), Badminton.

Class D. Softball, Table Tennis, Fencing, Golf, Field Events (Weights only), Bowling, Volleyball.

These subjects were divided into the following groups:

Under 20 years of age—Group 1.
Between 20 and 39 years—Group 2.
Between 40 and 59 years—Group 3.
Between 60 and 79 years—Group 4.
Above 80 years—Group 5.

RESULTS

Group 1 (under 20 years of age). There were 41 cases in this group, all still participating in athletics. None revealed any history suggestive of actual or potential heart disease or any evidence on physical or other examination of organic heart disease.

Only one of this group was placed in Class C category. His measurements were within normal range.

Forty were placed in Class A. Nine of these, or 21 per cent, showed more than plus 10 per cent deviation from the normal variation between actual and predicted *transverse diameters.* Twenty-four, or 58 per cent, exhibited more than plus 10 per cent deviation between the actual and predicted *heart frontal areas.* Twenty subjects, or about 50 per cent, revealed more than plus 10 per cent

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*Study conducted at the Wolffe Clinic under the auspices of the Philadelphia Association for Health, Physical Education, and Recreation, and a group of cardiologists. *Study Committee:* Grover W. Mueller, chairman, Wilfred C. Collin, Wilbur C. DeTurk, Dr. Victor A. Digilio, Dr. Daniel J. Donnelly, Fred E. Foertsch, Martha A. Gable, Hans C. Gordon, William L. Hughes, William V. Krebs, Dorothy R. McQueen, Dr. Max Schumann, Dr. Joseph B. Wolffe. *Advisory Committee of Athletes:* Constance M. Applebee, Lt. Patty Berg, Barney E. Berlinger, Roberta R. Bonniwell, Dorothy Evans, Wallace F. Johnson, John B. Kelly, Thomas P. Loughran, Alice Marble, Daniel J. McNichol, Jack C. Medica, Agneta Powell, Emil Preiss, Charles H. Spalding, Jr., Ira F. Thomas, Anne Townsend, Louis A. Young.

*This classification was worked out by a committee of physical educators and athletes under the chairmanship of Mr. Grover W. Mueller.

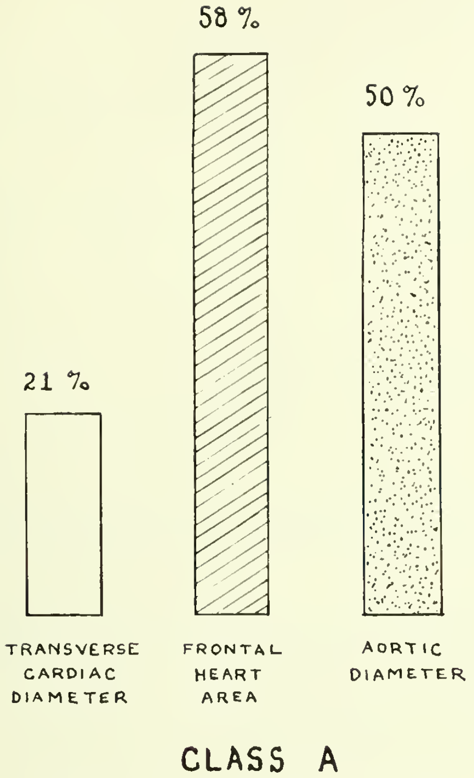

Fig. 1. Percentages deviating above the normal range—Group 1, Class A.

deviation between the actual and predicted "*aortic*" *diameters.* (Fig. 1).

Group 2 (20 to 39 years of age). There were 53 subjects in this group. One was unclassified, reducing the number to 52. These were classified as follows: 36 subjects Class A, 14 Class B, and 2 Class C.

Class A: Two cases were excluded from Class A because of hypertension; thus 34 subjects remain for analysis. The variations between actual and predicted transverse cardiac diameters range from minus 18 per cent to plus 20 per cent (22 from zero to plus 20 per cent, 8 showing more than plus 10 per cent, and 12 from minus 18 per cent to minus 3 per cent). Therefore, about 24 per cent exhibited transverse cardiac diameters greater than plus 10 per cent of the normal range.

The variations between actual and predicted frontal heart areas range between minus 19 per cent and plus 30 per cent (7 showed less than zero deviation, 27 varied from zero to plus 30 per cent, 14 of which exhibited more than plus 10 per cent deviation). Thus about 48 per cent demonstrate more than plus 10 per cent deviation.

The variations between actual and predicted aortic diameters range between minus 30 per cent and plus 19 per cent. Eight of these exhibit more than plus 10 per cent deviation—about 23 per cent. (Fig. 2.)

Class B: These subjects (14) show variations between actual and predicted transverse cardiac diameters from zero to plus 25 per cent. Four (about 28 per cent) reveal more than plus 10 per cent deviation.

The variations between actual and predicted frontal heart areas range from plus 1 per cent to plus 44 per

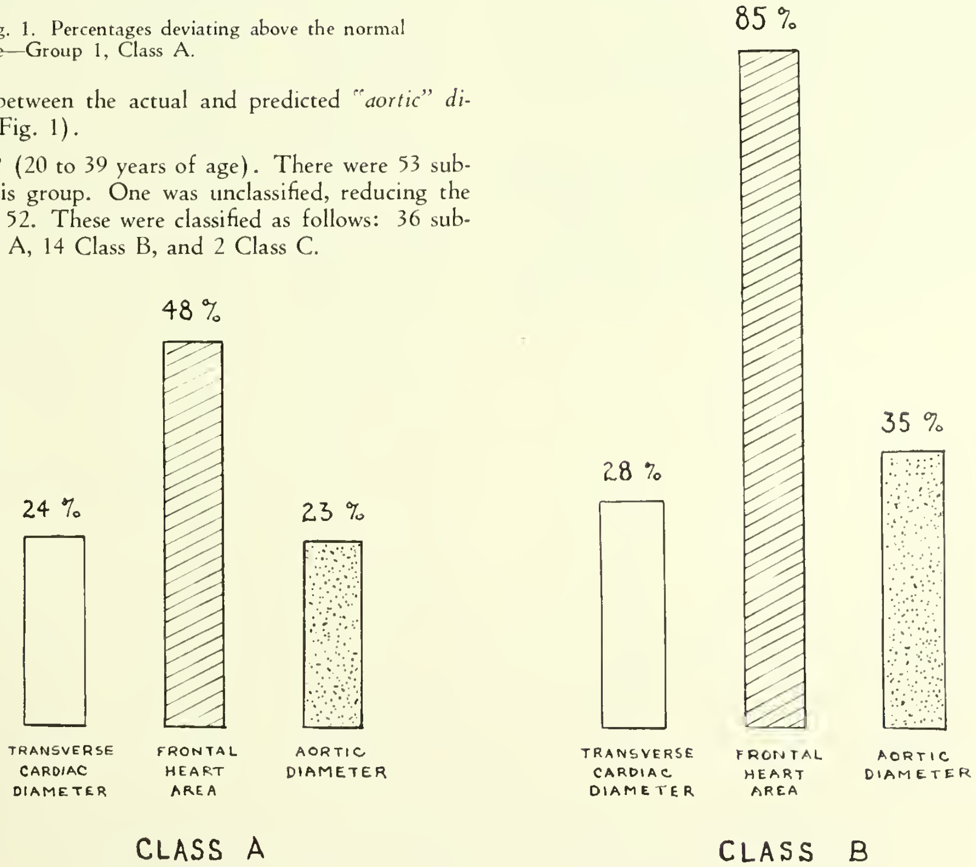

Fig. 2. Percentages deviating above the normal range—Group 2, Classes A and B.

cent. Twelve cases, or about 85 per cent, show more than plus 10 per cent deviation.

The variations between actual and predicted aortic diameters range from minus 9 per cent to plus 23 per cent. Five cases, or about 35 per cent, exhibit more than plus 10 per cent deviation. (Fig. 2.)

Class C: One of these two subjects had definite organic heart disease (aortic stenosis, probably of rheumatic origin). He presented the largest percentile deviation of frontal heart area (plus 60 per cent) noted in this entire study. The other subject (presumed normal) exhibits plus 16 per cent deviation in transverse cardiac diameter, plus 41 per cent deviation in frontal heart area, and plus 11 per cent deviation in aortic diameter.

Group 3 (40 to 59 years of age). 76 subjects exhibiting complete data comprise this group. 12 of these are excluded from consideration here because of evidence of hypertension and/or other potential or actual organic heart disease. This group is thus reduced to 64 subjects.

Class A: 42 subjects. The range of variation between actual and predicted heart diameters is from minus 15 per cent to plus 30 per cent. Fourteen cases, or 33 per cent, reveal a deviation of more than plus 10 per cent.

The variations between actual and predicted frontal heart areas range from minus 15 per cent to plus 41 per cent. Eighteen subjects, or 42 per cent, reveal more than plus 10 per cent deviation.

The variations between actual and predicted aortic diameters range from minus 14 per cent to plus 29 per cent. Eight cases, or 19 per cent, show more than plus 10 per cent deviation. (Fig. 3.)

Class B: 19 subjects. The variations between actual and predicted transverse cardiac diameters range from minus 9 per cent to plus 23 per cent. Ten cases, or 52 per cent, exhibit more than plus 10 per cent deviation.

The variations between actual and predicted frontal heart areas range from minus 2 per cent to plus 47 per cent. Fifteen cases, or 83 per cent, reveal more than plus 10 per cent deviation.

The variations between actual and predicted aortic diameters range from minus 16 per cent to plus 19 per cent. Four cases, or 21 per cent, show more than plus 10 per cent deviation. (Fig. 3.)

Class C: 3 subjects. One case reveals plus 18 per cent deviation in transverse heart diameter. Two others exhibit findings within the range of normal.

All subjects show more than plus 10 per cent deviation in frontal heart areas. The highest is plus 40 per cent.

Two subjects reveal deviations in aortic diameters of more than plus 10 per cent.

Group 4 (60 to 79 years of age). There are 7 subjects in this group, 3 cases are in Class A and 4 are in Class B.

All 3 subjects in Class A exhibit cardiac and aortic measurements in excess of the normal range of variation. Two of these show evidence of organic heart disease.

One of the 4 subjects in Class B reveals abnormal measurements. In the other 3 cases all measurements fall within normal range except for a deviation of plus 41 per cent in aortic diameter in one subject.

Group 5 (96 years of age). This one subject reveals: plus 29 per cent deviation in transverse cardiac diameter,

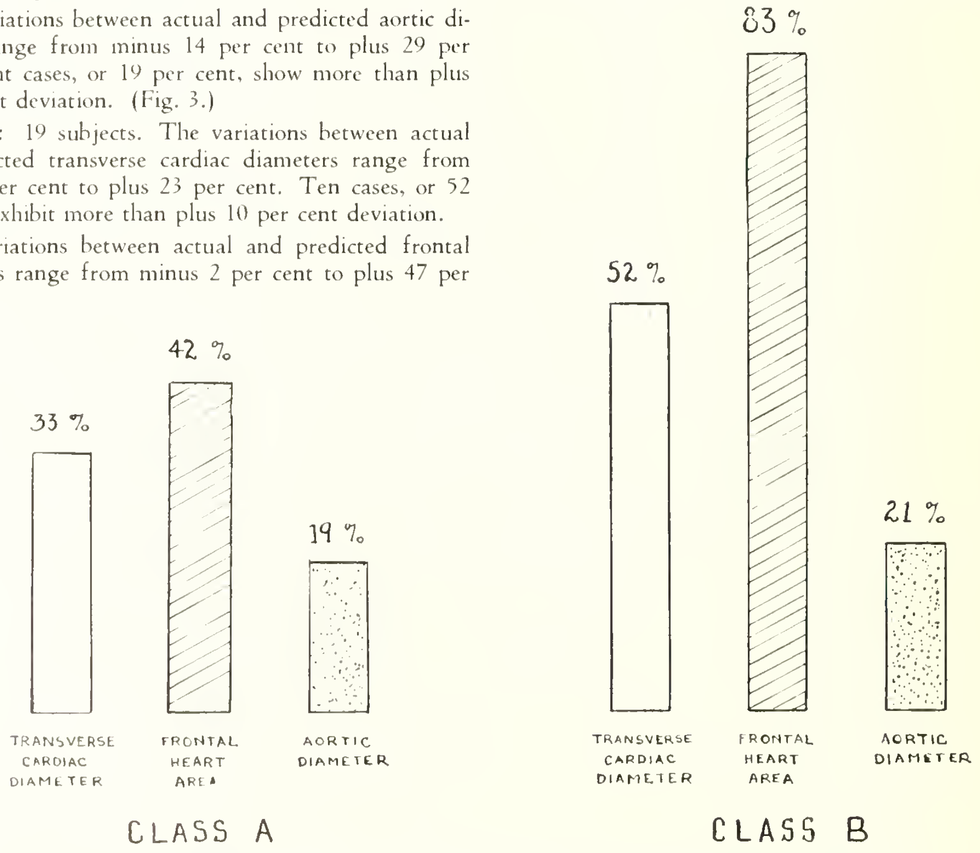

Fig. 3. Percentages deviating above the normal range—Group 3, Classes A and B.

plus 44 per cent deviation in frontal heart area, and plus 21 per cent deviation in aortic diameter.

TABLE 1*

	T.C.D.	(P.E.)	F.H.A.	(P.E.)	A.D.	(P.E.)
			Class A			
Group 1	21%	(2.2)	58%	(6.0)	50%	(5.4)
Group 2	24%	(2.7)	48%	(5.4)	23%	(2.7)
Group 3	33%	(3.4)	42%	(4.4)	19%	(2.0)
			Class B			
Group 2	28%	(5.1)	85%	(15.5)	35%	(6.1)
Group 3	52%	(8.1)	83%	(12.8)	21%	(3.4)

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*T.C.D. = Transverse cardiac diameter; F.H.A. = Frontal heart area; A.D. = Aortic diameter; P.E. = Probable error.

COMMENT

The subjects of Groups 4 and 5, because of their small number, do not permit any conclusions. The same may be said for the subjects in Class C in all groups. However, the numbers of cases in Groups 1 to 3 inclusive are sufficiently large.

The frontal heart areas reveal the highest percentage of deviations above the normal range. This is especially evident in the Class B athletes of Groups 2 and 3. The greatest percentage of deviations occurring in the latter groups is interesting because, for one thing, Class B sports are less strenuous than Class A sports. Moreover, both groups involve age ranges when the subjects tend to retire from strenuous sports. On the other hand, the subjects in Class A sports, although revealing high percentages of deviations in the frontal heart areas, exhibit palpably lower percentages of such deviations than shown by the subjects in Class B of Groups 2 and 3.

The percentages of deviation in the frontal heart areas in the Class A athletes appear interesting, especially when the results of each group are compared. The highest percentage appears in Group 1. Somewhat smaller percentages are noted in Groups 2 and 3. The results in the latter two groups are in fairly close agreement. It is interesting that the subjects in Group 1 present deviations in greater percentage than is the case among subjects in Group 2 or Group 3. The Group 1 subjects were still in active sports at the time of these examinations. On the other hand the subjects of Groups 2 and 3 have reached the age when retirement from active competition tends to occur. Deviations from the predicted transverse cardiac diameters seem to occur in rather high percentages. The latter appear to increase in the higher age groups. The percentage of these deviations is highest in the Class B subjects of Group 3 (the older age group, members of which have done less strenuous activity than those in Group 2).

Deviations from the predicted aortic diameters occur in unexpectedly high percentages in Group 1 and tend to diminish markedly in Group 2 and Group 3. It is probable that the aortic diameters are not what they appear to be in the subjects of Group 1. Two reasons seem to offer a likely explanation: (1) The aortic walls of the young are more dynamic than those of older people; and (2) the supracardiac shadows include the superior vena cava shadow, which may be a greater part of the supracardiac shadow than is true in older age groups.

It is interesting that the deviations in heart frontal areas and aortic diameters in the subjects of Group 1 (the youngest age group) are parallel. This will be discussed in subsequent publications.

SUMMARY

1. The frequency of deviations from the predicted transverse cardiac diameters tends to increase with age among the subjects of this study, and is highest in the higher age groups (40 to 59) of the Class B athletes.

2. The frequency of deviations from the predicted frontal heart areas seems to be greatest in Class B athletes between 20 and 59 years of age. Although the frequency is less in Class A athletes of all age groups, it is rather high.

3. The frequency of deviations from the predicted aortic diameters tends to be lower with increasing age among the subjects between 20 and 59 years of age included in this study.

IMPLICATIONS

1. The size of the athlete's heart may differ normally from so-called accepted standards.

2. The significance of cardiac enlargement should only be interpreted after a prolonged nation-wide investigation of athletes, including longevity and mortality.

3. This study may be considered only as a survey of a very important problem.

4. A nation-wide study is urgent because we are now encouraging vigorous physical activity in all schools and colleges, as a result of the war and of the physical fitness program. This could best be accomplished, perhaps, by a project which could be started in these United States patterned after The Research Board for the Correlation of Medical Science and Physical Education of the British Isles. Perhaps no more lofty goal could be hoped for than the aims* outlined by this board at its first meeting:

1. To ensure more general recognition of the need for health and physical education in the widest sense.
2. To achieve more general co-ordination between authoritative groups dealing with various aspects of the subject.
3. To pool the experience of national groups so that it may be of use to all.

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*Report by The Research Board for the Correlation of Medical Science and Physical Education. Published by the Research Board for the Correlation of Medical Sciences and Physical Education and the Ling Physical Education Association, Hamilton House, Bidborough Street, London, W. C. 1.

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Book Reviews

Treatment by Diet. Clifford J. Barborka, M.D. New (fifth) edition, 1948. 784 pp.; 14 plates, 13 in color. Philadelphia: J. B. Lippincott Company. $10.00.

Since the fourth edition of this work, issued in 1939, the quantum of knowledge in the field of nutrition has increased enormously. Selection from this great mass of data of material for practical applicability to human necessities demands sound judgment and sensible discrimination. Dr. Barborka has performed this task ably and the fifth edition of *Treatment by Diet* reflects his broad clinical experience in adapting new concepts of human requirements and recently developed nutrient elements to individual practice.

For each condition in which diet is of primary or secondary importance, the exposition of anatomical, physiological and biochemical bases for nutritional management and regulation are sufficiently erudite for physicians, but not too learned for clear understanding by nurses or dieticians.

The material is classified, tabulated and charted for ready use by practitioners or hospitals. The appendix of about 40 pages includes valuable information of weights and measures, quantitative and qualitative composition and content of simple and complex foods, useful recipes, and description of a few methods of urinalysis. The list of references appears to be inclusive and the index is adequate.

J. C.

Fatigue and Impairment in Man, by S. H. Bartley, Ph.D., and Eloise Chute, M.A. New York: McGraw-Hill Book Co., Inc. 429 pages. $5.50.

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The authors, in this volume, have defined the term "impairment" as a condition of tissue which is directly measured by physiological and biochemical analyses. Fatigue to them is an experience and constitutes an expression of the whole organism which can only be described in personalistic terms. Although everyone experiences fatigue, still knowledge of fatigue from the laboratory is very slight. Obviously, by assuming such a broad definition the authors are enabled to cover an extremely large number of conditions that might influence fatigue, such as: anoxia, hypoglycemia, alterations in temperature, water lack, salt lack, metabolism, nutrition, drugs, conflict and frustration. In covering this wide range of subjects, the authors have done a good job in surveying the field and reviewing the various topics in a concise manner. The authors, after a discussion of the many factors that might influence fatigue, conclude that fatigue is not an entity that can be described in quantitative terms and that its investigation would require an analysis of the individual.

Although the subject of this book appears quite restricted, still the many related subjects covered by the authors lend value and interest to this work.

A. B.

Pain, by Harold G. Wolff and Stewart Wolf. Springfield, Ill.: C. C. Thomas, Publisher, 1948. 94 pp., 21 figures, 102 references. $2.00.

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"What is pain?" is one of the first questions asked by a medical student. A satisfactory answer is seldom given. Wolff and Wolf provide substantial data for explanation of pain arising from all structures and systems of the body. Their description of cutaneous peripheral pain as bright, and of visceral, deep pain as dull, is ingenious and helpful. Beliefs that visceral mucous membranes are insensitive to stimuli that induce pain to skin are proved false. Lining surfaces of stomach, colon or bladder, when hyperemic from any cause, inflammatory or neurogenic, are pain-sensitive to the pinching, pricking stimuli that induce pain from skin application. Bronchial mucosa becomes pain-sensitive when inflamed.

A distinction is properly made between pain perception and reaction to pain; that is, threshold response to stimuli depends upon the receptive acuity of the agitated tissue which may be, in a particular instance, lowered by hyperemia. But the reaction of an individual to painful stimulus is conditioned by past experience and current state of neuropsychic stability. Everyone knows that awareness of physical discomfort is enhanced by state of nervous instability, whether exhilaration or fatigue.

General considerations, the text explains clearly and concisely the mechanisms and pathways concerned with instigation, transmission and perception of pain associated with several commonly experienced disorders.

This publication is the fifth in the American Lecture Series, designated as a monograph in American Lectures in Physiology, edited by Robert F. Pitts, Professor of Physiology, Syracuse University School of Medicine. The binding of semi-limp black leather with gold stamping is unusual for a medical or scientific book.

J. C.

Textbook of Pathology, by William Boyd, M.D. Philadelphia: Lee & Febiger, 1947. Fifth edition, text revised, 1049 pages, 500 illustrations. $10.00.

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Dr. William Boyd has again given us his very readable and comprehensive *Textbook of Pathology* as an introduction to medicine. As ever, its popularity is evidenced by the fact that the 1947 edition has already been reprinted in January, 1948. The author's style is such as to help the reader remember what he has read. The thirty colored illustrations are exceptionally well done and the entire format of the book is attractive. Dr. Boyd has included in his references after each chapter recent articles.

The book is divided into a part on General Pathology and a part on Special Pathology. The first includes injuries, repair, inflammation, degenerative processes, disturbances of metabolism, tumors, growth and the like, while the second part is divided according to the organ or system. Symptoms and prognosis are presented in small type in the important diseases. The section on tumors is less satisfactory than the others.

This book, which is familiar to most medical students and doctors, is to be highly recommended as a textbook or reference book of pathology.

H. W.

Thrombophlebitis and Phlebothrombosis*

Earl C. Henrikson, M.D., L. G. Idstrom, M.D., and Richard S. Rodgers, M.D.
Minneapolis, Minnesota

Thrombophlebitis is a thrombosis with associated inflammatory changes in the vascular endothelium secondary to bacterial perivenous lymphangitis, or in some instances, endothelial changes from toxins or allergic sensitization. The basic clot is a white or mixed thrombus made up essentially of platelets and leucocytes firmly attached to the vein. There may be a friable "tail" on the white clot composed of erythrocytes and fibrin which may become adherent to the vein and become organized. If it breaks off it becomes an embolus. This may occur in 10 to 15 per cent according to Loewe, Rosenblatt, and Hirsch. In suppurative thrombophlebitis, liberated proteolytic ferments may liquefy the fixed clot and resultant loosened fragments may form septic emboli.

Phlebothrombosis, or deep quiet thrombosis, is a thrombosis due to an increase in the coagulability of the blood with circulatory stasis as the precipitating factor. There is no inflammation in the vein wall. The clot is very loosely attached. The stasis may be due to shock, increased intra-abdominal pressure, varicose veins, or immobilization such as after accidents, operations, deliveries, and prolonged illness. Other factors in the formation of thrombosis are as follows:

1. Increasing age
2. Alterations of the vascular system
3. Vasospastic influence of the seasons (more common in winter and in northern countries)
4. Obesity
5. Debility
6. Anemia
7. Polycythemia
8. Excessive smoking
9. Dehydration due to vomiting and rapid diuresis
10. Trauma. Tissue injury changes the constituents of the blood stream leading to increase in coagulability of the blood. The platelet count increases following a surgical procedure. The increase begins in the fourth day after operation, is at its maximum on the tenth day, and then tapers off to normal by the twenty-first day. Dr. Quick states that platelet agglutination precedes their lysis which in turn initiates coagulation. When clumping of platelets is prevented, clotting does not occur. When clumping occurs thromboplastin is liberated.

It is difficult to decide whether a patient has thrombophlebitis or phlebothrombosis in some instances, especially since there is disagreement among authors as to the presence of fever, increased pulse rate, and elevation of sedimentation rate in phlebothrombosis. As shown in Table 1, Drs. Ochsner and Allen indicate that some of these conditions are present in phlebothrombosis. My own feeling would be that when such findings are present, the diagnosis should be thrombophlebitis rather than phlebothrombosis.

Therapy

In the past few years there has been considerable controversy as to whether thrombosis, be it either the "quiet" or phlebitis type, should be treated (1) surgically, or more conservatively (2) by anti-coagulants. One school, as typified by those in New York, believes that best results are obtained by using anti-coagulants alone. Another school, as typified by Allen and Linton at the Massachusetts General Hospital in Boston, goes to the other extreme and recommends ligations even prophylactically in certain types of procedures in patients over 40 years of age. Another school is that headed by Alton Ochsner of New Orleans who jokingly remarked that while geographically he is nowhere near being between Boston and New York, in the treatment of thrombosis he *is* between them in that he does not use *only* coagulants and does not use *only* ligation. Instead he states that he ligates only those that *need to be ligated.*

In considering the treatment of thrombosis of both types, the following points should be considered:

A. Prophylaxis:
   1. Eliminate all foci of infection.
   2. Cardiovascular disturbances must be treated to re-establish cardiac function.
   3. Refrain from smoking ten to fourteen days preoperatively because of vasospastic effect.
   4. Apply compression bandages from toes to groin in patients past 40 years of age, especially in those with varicose veins as it speeds up circulation in deep veins and overcomes circulatory stasis.
   5. Reduce weight in elective surgical cases.
   6. Correct any blood dyscrasias, such as anemia or polycythemia.
   7. Since increased coagulability of blood is dependent on tissue injury, it is imperative to avoid as much trauma as possible:
      a. Use sharp dissection.
      b. Avoid mass ligatures.
      c. Use fine non-absorbable sutures. (Ochsner advises cotton.)
   8. Prevent circulatory collapse during or after surgery by:
      a. Administration of fluids.
      b. Re-establishment of blood volume.
   9. Avoid postoperative distention — use intranasal suction siphonage and rectal tubes p.r.n.
   10. Avoid tight abdominal binders to obviate stasis in lower extremity.

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*Presented at Swedish Hospital Staff Meeting, Minneapolis, Minnesota, August, 1947.

TABLE 1

	Thrombophlebitis	Phlebothrombosis			
		General Concept	Allen	Homans	Ochsner
Type of Clot	Adherent white	Loose red			
Signs of Local Inflammation	+	—			
Swelling (Edema)	Prominent	Absent to moderate	66%	67%	
Faint Cyanosis, Leg Dependent				Absent or slight	
Positive Homans' Sign	+	±	41%	Almost always	
Lymphadenitis	+	—			
Leucocytosis	+	—			
Reflex Vasospasm	+	—			
Sedimentation Rate	Elevated	Normal			Elevated
Thrombosis of Superficial Veins	+				
Slight Rise in Temperature, Pulse, and Respirations at Same Recording			+		
Tachycardia Out of Proportion to Other Findings		±			+
Fever	+	—			
Tenderness of Femoral Vessels	+				
Complications	Long-continued edema and disability	Pulmonary Embolism			
Pain	+	—			
Tenderness of Calf Muscles		±	66%	61%	+
Sense of Impending Disaster		±			+

11. Place head down on return from surgery — favors return of venous blood from lower extremities. Keep so until recovered enough to move around well.
12. Avoid Fowler's position as much as possible.
13. Begin active muscular contraction of calf muscles against resistance.
14. Encourage deep breathing.
15. Encourage early *ambulation*—not just early rising to sit in a chair.
16. Administer anticoagulants in those who have had previous trouble.
    a. Dicoumarol
    b. Heparin (remember neostigmine and sulfonamides increase Heparin sensitivity).

Those drugs have been administered routinely prophylactically postoperatively by Barker, Waugh, DeTakats, and others. Ochsner believes they are too dangerous for routine use, but that they should be administered to those who had previously had thrombosis, or to those who probably have a tendency to thrombosis.

Once the acute symptoms are over the patient should be advised as follows:

1. Avoid strenuous exercises of all types for at least a year.
2. Exercise lightly by walking, wearing elastic stockings to the knee, and by swimming lazily.
3. Wear an elastic stocking at all times for at least a year, except when recumbent.

4. Keep the leg elevated whenever possible. The foot of the bed should be elevated.

He should further be advised that he may have pain in his legs for years, but that most of these pains are of no consequence. The pain will be relieved by lying down with the feet elevated for an hour. If not relieved in two hours, he should call his physician.

B. Active therapy in thrombosis:

1. *Uncomplicated cases of thrombophlebitis*
    a. Ochsner secures vasodilatation by novocaine block of the regional sympathetic ganglia because the symptoms are due to vasospasm and associated arteriospasm. Ninety per cent get immediate relief in one blocking, ten per cent need two blocks. (Drawings showing the technic can be found on page 242 in Christopher's "Surgery".)
    b. Get patients up as soon as possible. DeTakats advises bed rest until the temperature has been normal for ten days. Ochsner states that 62 per cent were discharged as cured within four days, 19 per cent left the hospital between the 9th and 12th day, and only 10 per cent were still in the hospital after 12 days.
2. In *suppurative thrombophlebitis,* usually associated with pelvic inflammatory disease from criminal abortion, there is liquefaction of the clot with production of septic emboli. Ligation of the vena cava and the two ovarian veins should be done using the transperitoneal approach. Collins of Tulane has done 22 vena cava ligations with 20 survivals. Of the two who died, one was moribund when operated upon, and one had pulmonary suppuration already far advanced at time of surgery. Mortality from surgery in 197 cases collected in 1917 by Miller was 51.6 per cent. Surgery was being done as a last resort at that time. It is advised that it be done early now, and as a result the mortality has dropped to 10 per cent.
3. *Phlebothrombosis.* Controversy is as to whether treatment should be conservative using anticoagulants or whether radical operative therapy is best. Barker and others feel that all forms of venous thrombosis can be treated by anticoagulants. Dosages as advocated by various groups are as follows:

Heparin

1. Quick—Maintain clotting time at about 30 minutes (normal 5 to 8 minutes). — (A) Continuous drip method: (a) 100 mgm. Heparin diluted with 500 cc. of normal saline I.V. (b) 15 to 25 drops per minute. (B) Intermittent method: (a) 50 to 75 mgm. Heparin 4 to 5 times daily I.V. (b) 100 to 125 mgm. as the evening dose I.V.
2. Bauer — 1st day — 150 mgm. t.i.d. I.V. Subsequent: 100 mgm. t.i.d. I.V. until temperature is normal. Then, 100 mgm. b.i.d. until up and active.
3. DeTakats—50 mgm. I.V. every 4 hours for 2 days. (Maintain capillary coagulation time at 8 to 10 minutes—three times normal). Check every hour.

    Dicoumarol orally given simultaneously. (Keep prothrombin time between 50 and 30 per cent of normal. If below 20 per cent give transfusion or massive doses of vitamin K—100 to 200 mgm.)

    For repeated attacks in ambulatory patient, such as in polycythemia, give 300 mgm. Dicoumarol a week, and do one prothrombin determination a week.
4. Loewe and associates—Heparin in Pitkin's menstruum (gelatin, acetic acid, dextrose, and distilled water).

    Initial dose: Patient 150 lb. or less—300 mgm.; patient over 150 lb.—400 mgm. Subsequent dosage: 300 mgm. every second day, then, after 2 or 3 implants, every third day. Do a Lee-White coagulation time at least once daily. Continue 10 to 14 days for uncomplicated thrombosis. Continue 3 weeks at least for thrombosis with embolism.

Dicoumarol

The symptoms of thrombophlebitis usually subside promptly after the administration of Dicoumarol. Autopsy studies in patients who have died of other causes a week or more after its use was begun have shown the proximal ends of the thrombi to be sealed over.

The advantages of Dicoumarol over Heparin are that (1) it is relatively cheap; (2) it can be given by mouth.

The disadvantages of Dicoumarol are that—

1. There is a latent period of from 12 to 48 hours before it is effective.
2. Daily prothrombin time determinations are necessary. A suitably equipped laboratory must be available. In malignant disorders, especially those involving the liver and pancreas, it may be difficult, if not impossible, to control the prothrombin level.
3. Continuation of its effect after stopping its use may result in serious hemorrhage and even in death. Heparin effect is short and can be quickly controlled merely by stopping its use or by giving 5 to 10 cc. of a sterile 1 per cent solution of protamin sulfate, or by giving 500 cc. of fresh citrated blood.

Barker, et al, of the Mayo Clinic, in

a series of 1,000 surgical cases treated prophylactically to prevent thrombosis reported as follows:

(1) One death occurred after the prothrombin time had returned to normal. (2) Thirty-nine patients (3.9 per cent) developed minor bleeding. (3) Twenty-five patients (2.5 per cent) had hemorrhages of a serious nature. (4) Sixty-four mgm. of synthetic vitamin K controlled the bleeding in 35 of 37 patients in which it was tried.

Dosage of Dicoumarol:

First day—300 mgm. if over 150 lb.; 200 mgm. if under 150 lb.

Second day—200 mgm. unless prothrombin time markedly prolonged.

Succeeding daily dosages: 100 to 200 mgm. depending on prothrombin time.

SURGERY

Arguments against the use of anticoagulants alone in phlebothrombosis are:

1. Anticoagulants prevent formation of more clots, but do not affect those already present.
2. Anticoagulants will not prevent the detachment of clots.
3. The clot is so loosely attached that immediate surgery is imperative to prevent pulmonary embolism.

Arguments against surgical procedures are brought out by the facts that in large series treated conservatively the results are much better than in series treated by ligation.

E. V. Allen at a Mayo Clinic Staff Meeting mentioned a recent series of 39 cases of pulmonary embolism in which ligation was done, and in spite of this, pulmonary embolism occurred in 9 cases, 3 of whom died. In 5 of the 9 cases, the embolism came from the leg opposite the one in which the vein was ligated.

In contrast to this, in 180 cases of non-fatal pulmonary embolism treated with Heparin and Dicoumarol, there was only one case of subsequent fatal embolism.

Dr. Clarence Dennis studied cases treated surgically as against those treated by anticoagulants at the University Hospital, and at the Minneapolis General Hospital, alternating the type of treatment back and forth between the two hospitals to equalize various factors, and came to the very definite conclusion that medical management was decidedly superior to the surgical management.

Surgical procedure: Ochsner advises ligation in all cases of phlebothrombosis as soon as the diagnosis is made. Local anesthesia is used. An incision is made over the upper end of Hunter's canal to expose about 6 cm. of the superficial femoral vein below the profunda. The superficial femoral is then incised distal to the profunda. If bleeding is free from the vein proximally, the superficial femoral is ligated distal to the profunda. If no free bleeding occurs, a glass cannula is inserted proximally and the thrombus is aspirated until free bleeding ensues. The vein is then ligated above and below the opening. If the profunda is involved also, it, too, should be ligated.

CONCLUSION

In general the literature and experiences at the Minneapolis General and the University Hospitals would indicate that conservative treatment is the one giving the most favorable results—

1. In pulmonary embolism where the source of the embolism cannot be determined;
2. In patients in whom there is an increased risk of thrombosis because of the type of surgical procedure, because of the patient's age, or complications such as coronary disease, or malignancy; and
3. When administered prophylactically where thrombosis or embolism previously occurred.

Surgery has a place in all cases of thrombosis

1. Where anticoagulants cannot be given with proper controls.
2. Where anticoagulants cannot be given because of the danger of hemorrhage from the operative site, as for example, in prostatic resections.
3. Where a pulmonary embolism has already occurred, and the source is found to be definitely in the lower limbs.
4. Where the thrombus has extended into the femoral vein as evidenced by local findings, and the duration of the disorder.
5. Where septic emboli are arising in the pelvic organs, in which instance, ligation of the vena cava and ovarian veins is life-saving.

If anticoagulants have not already been tried with relief or if their use is not contemplated, sympathetic block should be tried in thrombophlebitis because of the frequent dramatic sudden relief it gives, and because prolonged edema and discomfort in later years may be eliminated.

* * * *

COMMENTS ON THE X-RAY FINDINGS WHICH MAY BE ASSOCIATED WITH THROMBOSIS AND EMBOLISM

L. G. Idstrom, M.D., Roentgenologist

The common source of embolism is from an area of thrombophlebitis or phlebothrombosis in the veins of the leg. If the embolus blocks a main pulmonary artery, no change may be apparent in the patient because of death which may ensue so rapidly. However, if emboli are noted in medium-sized vessels, and an X-ray film is taken, there may be no findings immediately; but after several hours, or within 24 hours, a density may be apparent in a portion of a lung. The density is due to several factors. A composite X-ray finding consists of an infarcted hemorrhagic area with a surrounding atelectasis and edema, and possibly emphysema.

The picture may be very similar to that seen in a bronchopneumonia. There may be multiple or single triangular or irregular densities which are lobular in distribution. Together with these areas there may be localized pleuritis and a small effusion. If there is associated cardiac failure, the findings of additional pulmonary congestion are noted. In this event, the hilum will be enlarged and there will be linear markings extending in a ray-like area to the periphery on one or both sides of the chest. In addition to these findings, a fine, either diffuse or localized mottling is seen in the lung fields. As the infarction clears, there will be ray or streak-like areas of atelectasis noted in the involved area. Involvement is most often seen in the right lower lobe.

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COMMENTS ON EXPERIENCES WITH THROMBOSIS AND EMBOLISM AT THE MASSACHUSETTS GENERAL HOSPITAL

Richard S. Rodgers, M.D.

The problem of phlebothrombosis and thrombophlebitis is one with which we were greatly concerned at the Massachusetts General Hospital. As a member of the resident staff of the Urology service there, my acceptance of the current treatment as recommended by Dr. Allen and his associates, namely interruption of both superficial femoral veins, has been facilitated by the fact that the danger of postoperative bleeding among the urology patients prevents the use of Heparin or Dicoumarol. Thus, patients who have been subjected to any type of prostatectomy, or to some of the conservative kidney operations, cannot be treated with a drug which prolongs their clotting time. Therefore, it was easy for our department to accept the more radical treatment which has given excellent results.

On the General Surgical Services, a fairly large group of patients who developed signs and symptoms of vein thrombosis was treated with Dicoumarol with promising results. But the necessity of following each patient closely with frequent determinations of the prothrombin time placed such a large volume of work on the laboratory that it appeared wiser from both the standpoint of the patient and the hospital to interrupt the deep veins. This resulted not only in a shorter period of hospitalization but also had no ill effects on the patient.

Up to the present time approximately 2,000 patients have had their superficial femoral veins interrupted. In one third of these procedures it was carried out as a prophylactic measure. Since 82 per cent of thrombosis and pulmonary emboli occur in people beyond the age of 40, and the danger of the complication increases with age, it has been the practice at Massachusetts General Hospital to ligate prophylactically the superficial femoral veins of all patients over the age of 65. Only one patient of this group died of pulmonary embolism, and at autopsy it was found that an embolus had originated in the stump of the vein which had been tied several centimeters below the junction with the profundus vein. In a similar group of patients who did not have prophylactic femoral vein interruptions, there were 55 instances of thrombo-embolic syndrome with 26 deaths from pulmonary embolism.

It has been the practice of the men at this hospital to get the patients out of bed and on their feet within 24 hours following operation if possible. In addition, the other commonly employed measures aimed at preventing venous stasis were adopted. This caused a notable reduction in the incidence of thrombosis and embolism, yet an occasional patient died of pulmonary infarction. This led to the custom of meticulously examining the lower extremities of every patient at least once, but more often twice daily. The presence of pain in the chest was always regarded as due to infarction until proved otherwise. Often a patient complained of soreness in one of his calves, and on examination a small amount of swelling, a little dilatation of the ankle veins, a positive Homans' sign, and a concomitant elevation of pulse, temperature, and respiration, would lead to a diagnosis of phlebothrombosis. The chest film was not relied upon to make the diagnosis because the infarction cannot be visualized for 24 hours after it occurs; but most of the patients were X-rayed in the anteroposterior and lateral positions after their femoral veins had been interrupted, and the characteristic area of density could be seen.

Unless thrombophlebitis developed, the patients had very little discomfort after operation. When inflammation was present it could usually be relieved by paravertebral sympathetic block. In very few instances did the complicating factor of thrombo-embolic syndrome require the patients to remain in the hospital longer than their primary operation required.

It might be mentioned that the practice of superficial femoral vein interruption is not confined entirely to patients of the Surgical Service. It has been found that many patients receiving medical treatment, particularly for congestive heart disease, showed a tendency to pulmonary infarction. Superficial femoral vein interruption has been life saving for many of these patients.

Although the attending men at the Massachusetts General Hospital are fairly definitely committed to the surgical treatment of phlebothrombosis and thrombophlebitis as a means of solving a problem which seems to be endemic in Boston, they do not feel that it is the only approach to the problem. It is my own belief that one method gives as good results as another with regard to an individual patient, and the primary purpose of such a discussion should be to stimulate ourselves to recognize the syndrome when it does occur after the usual preventive measures have been followed.

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◀ AMERICAN STUDENT HEALTH ASSOCIATION ▶

The Student Health Service in the Postwar Era*

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During the past six years our universities and colleges have been called upon to meet many unusual and disturbing situations. Soon after the passage of the Selective Act of 1939 it was not difficult to foresee some of the more acute problems with which our universities would be confronted. Early in 1942 the pattern of things to come became more clearly defined. All of us then realized that the immediate years ahead would present new and challenging problems and call for continuing readjustments. Many of our Student Health Services carried on during this critical period with inadequate personnel, yet were called upon to render an unprecedented volume of services. At many institutions prevailing conditions made it necessary to curtail or even abandon some of the more desirable features of our health programs. Under war-time conditions, therefore, many Student Health Services remained more or less static and the development of new departments lagged far behind normal expectations.

At the close of the war, two and a half years ago, I am sure that we all looked to the future with renewed confidence. The opportunity to resume orderly planning for more effective and more constructive health programs was most encouraging and stimulating. Steadily increasing enrollments provided more adequate budgets. Much of the uncertainty of the preceding years had been lifted and it was indeed reassuring to be able to anticipate, with reasonable accuracy, conditions which would prevail from year to year. We find, however, that the postwar era is much more demanding than many of us had anticipated. Our colleges and universities have found it exceedingly difficult to accommodate the tremendous increase in enrollments and at the same time maintain educational standards as high as in the years before the war. Interesting and absorbing as the problems of this period have proved to be, we in the student health field must give serious thought to what lies ahead.

The very substantial increase in demand for college education at this time is quite similar to the experience following World War I. Enrollment in colleges now stands at approximately two and a half million students, an increase of one million over the pre-war level. According to a recent estimate by the United States Office of Education, an additional three hundred thousand college students must be provided for by 1950. A commission recently appointed to study the needs of higher education in California has recommended the construction of three new four year colleges and eight junior colleges. In New York State, which has no state university, careful study has prompted a rather unique proposal whereby a number of community colleges would be established throughout the state in preference to the usual plan of one large state university. It is contended that this plan has the very distinct advantage of combining low tuition with reduced living costs, since the community plan would permit a relatively high percentage of students to live at home. The Commission making the New York survey estimated that by 1960 additional facilities should be available for 30,000 four year students and 80,000 two year students. Some educators are much more conservative in their estimates of the probable duration of the present unusual demands for secondary education. There appears to be quite general agreement, however, that should enrollment in colleges continue to increase over a period of years, it would seem wiser to increase the number of colleges rather than to further tax the facilities and resources of existing institutions. Should such conditions as outlined above actually materialize during the next decade, our large universities will undoubtedly be called upon to serve chiefly as centers for professional and graduate training and for the coordination of the ever-expanding and varied programs of research.

Whether or not we are entirely receptive to the present trend towards a continuing extension of this great experiment in democratic education, this association cannot very wisely adopt a wait-and-see attitude. Already the demand for physicians to serve in college Health Services is rapidly taking the available supply. In view of prevailing conditions, I believe this situation will become more acute during the next several years. There are several valid reasons, I believe, for this assumption. Moreover, they are all tied in rather closely with present economic conditions. The national income for 1948, based on its present rate, will be approximately 200 billion dollars. In 1935-36 it was 64 billion. Incomes for the past several years have reached the highest levels ever recorded in our history. Expenditures for medical care have exceeded all previous figures by a wide margin. The increasing demands for medical services have thus contributed to a substantial increase in physicians' incomes. Our recent medical graduates are well informed regarding these conditions. Moreover, we find a much higher proportion than ever before are preparing themselves for the various specialties. This has considerably narrowed the field of prospective candidates for our Health Service staffs. Should present economic conditions prevail for an extended period of time, we may experience considerable difficulty in maintaining our departments at desirable levels of efficiency due to an actual shortage of physicians.

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*Presidential address, presented at the 26th annual meeting of the American Student Health Association, Detroit, May 7, 1948.

In spite of conditions which may appear to be somewhat unfavorable at times, I am confident that during the coming years we shall see very substantial progress and well-planned expansion in the college health field. Health programs will undoubtedly be developed at many institutions which have never previously provided adequately for continuous supervision of the health of their students. A considerable number of new departments have been organized during the past two years. Many of these colleges will look to this organization for help in the planning of desirable programs and in obtaining physicians trained in student health work. Some of us serving at the larger universities are receiving numerous inquiries regarding available, qualified physicians. It is my hope that at this meeting we may develop some plan whereby this association may be better able to render all possible assistance to those institutions which may seek our advice concerning their various problems.

It is evident from the report of our secretary, Dr. Blydenburgh, that the number of physicians engaged in student health activities has increased rather sharply during the past two years. Membership in this association now stands at 212 institutions. Reports received by Dr. Blydenburgh from 145 universities and colleges show that at these institutions 295 physicians serve on a full-time basis and 405 are on part-time service. In view of the fact that there are approximately 880 accredited universities and colleges in the United States, it is obvious that the total number of physicians participating in college health programs is well in excess of the above figure. In my opinion there will be a steadily increasing demand for well-qualified physicians in college health services over a period of years. The Student Health Service has become an indispensable part of most of our larger institutions. Many departments are now organized as well-integrated groups and function most effectively with the many advantages offered by this type of practice. Proper emphasis is placed on the broader concepts of preventive medicine. The college health service is also making a very substantial contribution to health education, not only through formal classroom teaching, but through the intimate personal contacts which we have with students who come to us for counsel and advice. One of the features of student health practice which is most gratifying to me is to observe the genuine enthusiasm with which college students participate in those phases of our health program which are farthest removed from the routine care of acute illness. Medical care today, for the vast majority of our citizens, is still largely a matter of emergency care. And this does not apply to only those segments of our population in the lower income brackets. Several years ago we conducted a study of an entering class at the University of Pennsylvania in an attempt to learn something of the health practices of these young persons during the years preceding their entrance to college. We found that only 16 per cent of men students had ever consulted a private physician for anything other than acute illness or injury. During their first year on our campus, 500 members of this entering class made 2,611 visits to our Health Service, an average of 5.2 visits per student. A subsequent study revealed that 18 per cent of students coming to our dispensary for all types of services, stated that they would have sought medical care under private auspices, had our student health facilities not been available. Departments at many other institutions are no doubt having quite similar experiences.

To those of our members who have recently joined us in this field, I want to say that you will find your work with students to be a most interesting and fascinating experience. The objectives of the modern student health program carry us well beyond the limitations set up by present day standards of medical care. Many of us are privileged to work under most ideal conditions. The opportunities for research in our student health services have been emphasized repeatedly by former presidents and others of this association. As our departments return to more nearly normal working conditions, we should give careful consideration to broadening the scope of our activities in various fields of investigative study. There are probably more than half a million students enrolled at institutions which have Health Service staffs sufficiently manned to carry on some type of research. Most of these students are available for more or less continuous observation and study over a period of several years. It might well be that our Research Committee could develop a plan whereby a considerable number of departments might participate in the same project. This would prove to be most stimulating, I believe, to many workers who, for various reasons, might not be able to carry on individual studies. This plan has been in effect for many years in our work in tuberculosis control. With more than 300 institutions cooperating, it has enabled the Tuberculosis Committee to make extremely valuable contributions. There are many ways in which our college health programs may be designed to meet more effectively the opportunities and the obligations of the post-war era. Approximately 6 per cent of our population is enrolled in universities and colleges. We in the Student Health Services must assume the major portion of the responsibility in providing ample safeguards for the student's welfare.

SAVE THE EASY WAY... BUY YOUR BONDS THROUGH PAYROLL SAVINGS

Experiences in the Topical Use of Pyribenzamine

Ralph E. Carrier, M.D., Edgar S. Krug, M.D., Herbert R. Glenn, M.D.*
State College, Pennsylvania

DURING the fall semester of 1946 we became interested in the use of Pyribenzamine ointment for topical application. At this time Ciba advised us that no crystalline Pyribenzamine was available so we had our pharmacist compound varying strengths in both anhydrous and water soluble bases. Rather quickly we arrived at 2 per cent water soluble base ointment as the one giving most consistent results without irritation. This was made by crushing P.B.Z. tablets and mixing the drug with the base selected.

From an active student health service whose visits last year, for all illnesses, totalled over 43,000, the following clinical conclusions are now possible:

1. As recently reported by Feinberg and Bernstein,[1] we found good results in a majority of our cases of *allergic dermatoses.* Relief from itching was almost always an immediate result and in many cases improvement in inflammation resulted probably from the lack of irritation and the absence of secondary invaders when scratching to relieve the pruritus was no longer necessary.

2. Likewise, as reported by the aforementioned workers, we found this ointment of great value in the treatment of *pruritus ani.* One of our cases had been treated in many ways by numerous physicians without relief. This patient is mentioned because of the severity of the pruritus which was interfering with the sleep of this individual and resulting in a marked nervousness, loss of weight, and inability to carry on his daily routine effectually. Application of P.B.Z. water soluble ointment relieved pruritus at once and improvements followed so that in several weeks time the anal region lost its "elephant hide" appearance and assumed a normal appearance. Improvement has continued over a period of months in this case of severe pruritus ani.

3. *Contact Dermatoses.* This ointment in our experience is a very valuable adjunct in the treatment of dermatitis due to plants, especially poison ivy; and in dermatoses due to physical agents as cold and to such known agents as nail polish, cosmetics, depilatory substances, deodorants and leather.

4. *Drug Eruptions.* Well established and used generally by the profession for their control.

5. *Urticaria.* While this condition is best controlled by internal medication with P.B.Z. still much of the pruritus may be relieved at once by the local application to the eruption.

6. *Dermatitis and Pruritus from Tineas (Trichophyton).* Much comfort results from the use of this ointment in the Tinea infections. Some few cases show a tendency to heal with this application but in most instances observed symptomatic relief was the only result.

7. *Dermatitis Intertrigo.* Relief is marked and gratefully received by obese women with pendulant breasts, especially during the summer months. Intertrigo in infants is rapidly controlled but, of course, this treatment must not replace that of cleanliness in these cases.

We found no clinical result in Lichen Planus and confusing results in Erythema Multiforme, some cases seemingly improved while others showed no change.

Additionally, we feel that in many instances bandage pressure seems to be important in effecting healing processes.

In many instances the local skin conditions are, of course, more rapidly and more completely eradicated by the combined topical and oral administration of this drug.

SUMMARY

Eighteen months of clinical observation in the use of Tripelennamine ointment is reported.

As previously reported by Feinberg and Bernstein, we found its greatest use in an allergic dermatitis and in the relief of pruritus ani. A case of severe pruritus ani is briefly reported.

Five other skin eruptions are reported upon favorably in our experience.

Pressure seems to improve healing processes with this ointment.

All types of dermatoses treated by us may or may not need to be supplemented with some antihistaminic drug by mouth to obtain maximum results.

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AUTOMATIC SAVING IS SURE SAVING - U.S. SAVINGS BONDS

Hypothyroidism

A Clinical Study on Students and Personnel at Kansas University

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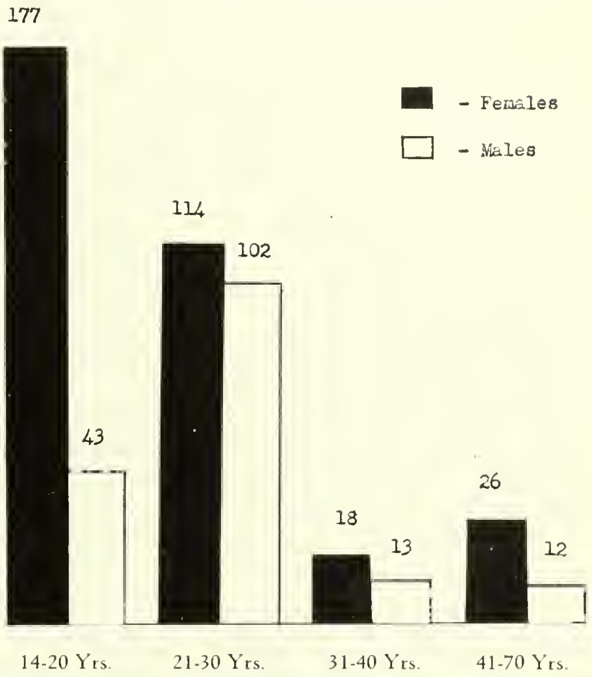
For several years at the Watkins Memorial Hospital of Kansas University, it has been observed that a considerable number of patients are seen and treated because of a mild to moderate degree of thyroid deficiency. Often these patients are found to have low basal metabolic rates associated usually with somewhat elevated serum cholesterol levels. In most of these patients a diagnosis of myxedema of the classical type cannot be made, nevertheless a significant number have been treated with thyroid substance over long periods of time, and more often than not the results have been gratifying.

The purpose of this paper is to present a study of the clinical records of 505 consecutive patients upon whom basal metabolism tests were performed during the 28 month period from September 1944 through December 1946. From the data thus accumulated an attempt has been made to set down the more common clinical findings and to correlate them with the results of thyroid therapy.

The distribution of the patients in this series as to age and sex is shown in Figure 1. There were 436 patients, or 86.3 per cent between the ages of 14 and 30 years. Two hundred ninety-one patients, or 57.6 per cent of the total, were females from 14 to 30 years of age. The predominance of women over men in this series may possibly be explained by the fact that most ablebodied young men were in some branch of the Armed Forces of the U.S.A. during the time interval covered by the greater part of this study. The majority of all patients past age 30 were either graduate students or faculty members.

Fig. 1. Age and Sex Distribution of Cases



Total Cases—505

The figures at the top of each bar represent the number of cases in that age and sex group. The figures at the bottom of each bar signify the age ranges.

The most frequent symptoms presented by these patients were fatigue, mental or physical sluggishness, menstrual disturbances, weight gain, dry skin, coldness and numbness of the extremities, vague joint paints, frequent gastrointestinal upsets, headache, feelings of tenseness, and emotional disturbances. Many complained of the inability to concentrate on their studies because of fatigue and lack of energy, thus resulting in low marks in their classes.

Upon physical examination, the findings were frequently meager and not necessarily characteristic of a thyroid deficiency. Dryness of the skin and hair, brittle nails, gradual loss of hair, and thinning of the eyebrows in the lateral portions were often seen. Several cases had acneiform skin eruptions. Puffiness of the periorbital and facial tissues was occasionally noted. Many patients showed a tendency toward obesity, although an appreciable number were underweight. In many of the females the hemoglobin was lower than normal, usually about 75 per cent. This latter finding was seldom as marked in the male patients.

Most of the clinical findings listed above have been described by previous authors as being characteristic of the milder thyroid deficiencies. Warren,[1] in 1929, tabulated the findings from 131 patients with basal metabolic rates of —20 per cent or below. None of these patients presented the classical picture of myxedema. Most frequently noted were fatigue, hypochlorhydria, and slight anemia. About as many were underweight as overweight. In 1933, Carey and Brumfield [2] reported a study of 489 non-myxedematous patients with basal metabolic rates of —10 per cent or below. The clinical findings were much the same as those described in this paper. One hundred thirteen of these cases were treated with thyroid extract and followed. Of these 71, or 62.8 per cent were definitely improved. Vandenberg [3] reported a 5 year study of 673 suspected hypothyroid patients whose symptoms were remarkably similar to those described above. A great many of his patients had minus basal metabolic rates; however, there were many with so-called normal rates who responded amazingly well to thyroid therapy. Jones [4] has listed most of the findings which are given in this paper as being characteristic of the mild hypothyroid state. In addition, he stated that a serum cholesterol above 200 mg. per cent is frequently but not always a finding. Reilly [5] has stated as follows: "Latent, mild, masked hypothyroidism is the more common form of deficiency. Classical descriptions of childhood and adult myxedema represent an outspoken deficiency of long duration." Davis [6] made a study of 290 female patients with basal metabolic rates below —10 per cent. Again the clinical findings listed by him correspond to those described above. Watkins [7] reviewed the records of 408 patients with basal metabolic rates below —10 per cent, and described a clinical picture which is almost identical to the one given in this paper. On 23 of his patients serum cholesterol studies were done and found to be high normal without relation to age, sex, or intensity of the disease.

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*From the Health Service, University of Kansas.

All of the basal metabolism determinations in this study were performed with the Benedict-Roth type of spirometer manufactured by the Sanborn Company. The basal metabolism standards used were those determined by Boothby, Berkson, and Dunn [8] at the Mayo Clinic in 1936. Frequent checks were made on the apparatus for leaks and other mechanical defects.

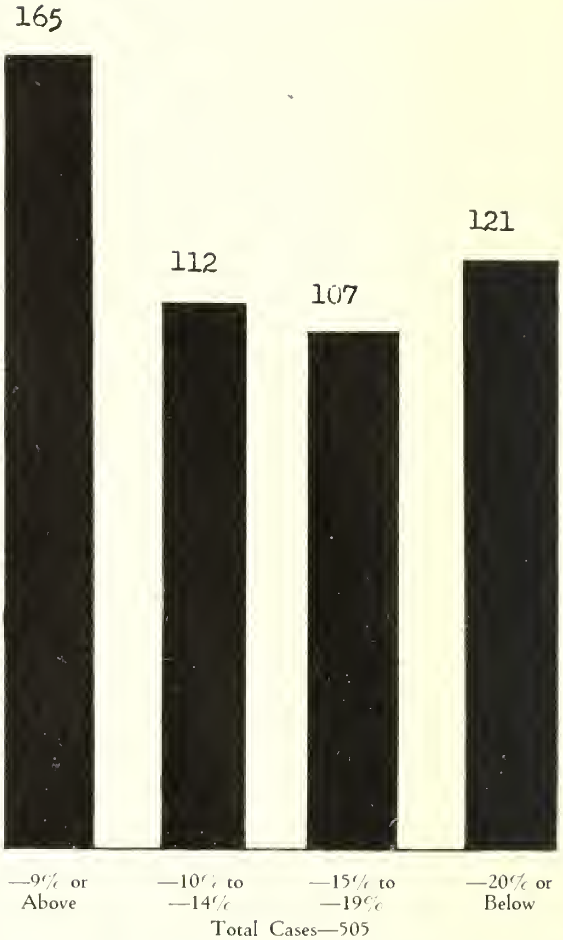
In Figure 2 is shown the distribution of the basal metabolic rates determined on each of 505 patients. The lowest B.M.R. found in each case is the one represented in the graph. Three hundred forty patients, or 67.3 per cent, had basal metabolic rates of —10 per cent or below. There were 228 cases, or 45.1 per cent, whose basal metabolic rates were —15 per cent or below.

Serum cholesterol levels were obtained in 367 cases of this series. The distribution of these determinations is shown in graphic form in Figure 3. In each case the highest serum cholesterol level determined is the one represented in the graph. The technique used by our laboratory for serum cholesterol determination is essentially the same as outlined by Bloor,[9] in 1916. The range of normal for the serum cholesterol by this method is from 150 to 200 mgm. per cent. There were 239 patients, or 65.1 per cent, out of the 367 patients, who were found to have serum cholesterol levels of 190 mgm. per cent or above. The range from 190 to 250 mgm. per cent is somewhat higher than normal; however, it is not necessarily to be considered pathologic. Seventy-six patients, or 20.7 per cent, were found to have serum cholesterol levels above 250 mgm. per cent.

Of the entire group of 505 patients, 161 were treated with thyroid extract, and followed over a sufficient period of time to allow a decision to be made as to the results of therapy. The average basal metabolic rate for this group of patients was —17 per cent. The average serum cholesterol was 226.9 mgm. per cent for the 138 patients upon whom that determination was made. There were 105 patients, or 65.2 per cent, of the total of 161 cases who were definitely improved on therapy with thyroid extract. For the majority of cases the optimum dose of thyroid was found to be two or three grains of the U.S.P. thyroid extract daily. Usually it was necessary to continue treatment from two to four weeks before any significant clinical response was noted.

Table 1 shows the individual complaints for which thyroid extract was given, together with the results of therapy on each group. The average B.M.R. and serum cholesterol level is tabulated for each group. Several patients had more than one major complaint. In such instances each complaint is tabulated separately. This will account for any discrepancies noted between the total number of patients treated and the total of complaints treated.

Fig. 2. The Range of Basal Metabolic Rates

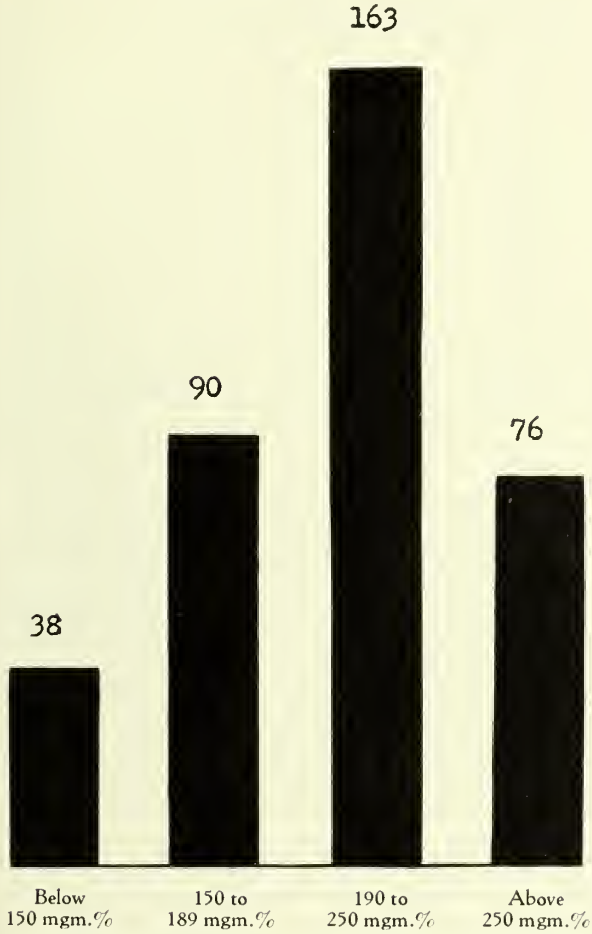


The figures at the base of each bar signify the BMR group. The figures at the top of each bar represent the number of cases in that particular range.

In the majority of cases fatigue was a symptom; however, 57 of the patients treated presented some form of fatigue, mental or physical sluggishness as the *chief* complaint. This symptom has been noted by many authors [1,2,3,4,5,6,7,11] as an almost constant complaint in those patients suffering from early or mild thyroid deficiencies. In this series 40 cases, or 70.2 per cent, were successfully treated with thyroid.

There were 62 female patients treated because of menstrual disturbances. In addition there were 3 females who were treated because of sterility. Of these 65 cases, 42, or 64.6 per cent, were definitely improved on thyroid therapy. These findings are in accordance with those of

Fig. 3. Range of Serum Cholesterol Determinations



The figures at the bottom of each bar represent the groupings according to the serum cholesterol levels. At the top of each bar is recorded the number of cases in that particular range.

a number of authors [10,11,12,13,14] who have reported studies on female patients complaining of menstrual disorders and/or sterility. Frequently these authors found their patients to have low basal metabolic rates, and noted that many of them responded quite favorably to thyroid therapy. The 3 cases of sterility in our series were students' wives, and the two cases listed as successfully treated became pregnant within six months after the beginning of treatment with thyroid. In this series the patient was considered to have amenorrhea if she had missed two or more menstrual periods in succession.

Table 1

Results of Thyroid Therapy upon Individual Complaints

Chief Complaint	No. Cases Treated	No. Cases Improved	Percent Improved	Ave. B.M.R.	Ave. Serum Cholesterol
Fatigue	57	40	70.2%	—18%	228.6 mgm.%
Obesity	33	22	66.6%	—18%	213.0 mgm.%
Dysmenorrhea	24	15	62.5%	—17%	213.6 mgm.%
Oligomenorrhea	15	11	73.3%	—16%	197.2 mgm.%
Amenorrhea	13	8	61.5%	—14%	245.7 mgm.%
Menorrhagia	10	6	60.0%	—13%	224.9 mgm.%
Sterility	3	2	—	—14%	188.0 mgm.%
Underweight	7	6	85.7%	—23%	184.3 mgm.%
Acne Vulgaris	12	8	66.6%	—19%	215.5 mgm.%
Nervous Symptoms	41	22	53.6%	—14%	229.5 mgm.%
Menopause	7	4	57.1%	—19%	282.7 mgm.%

Thirty-three patients in this series were treated for obesity. In addition to reducing diets these patients were given thyroid extract. Most of these cases were found to have lowered basal metabolic rates and somewhat elevated serum cholesterol levels. Frequently, these patients had such associated symptoms as fatigue, menstrual disorders and others of those already listed. There were 22 of these patients who were definitely improved on the combination of reducing diets plus thyroid extract. Whether much credit can be given to the use of thyroid in causing these patients to lose weight cannot definitely be determined. Perhaps some of the initial weight losses occurring in some of the cases can be accounted for as being due to loss of tissue fluids. Plummer [15] reported a study of 200 myxedematous patients, and noted a rapid initial weight loss, averaging 13 pounds per patient, which occurred soon after placing these patients on thyroid extract. This weight loss was considered to be due to the loss of water. Most of the hypothyroid patients in our series who were treated for obesity noted improvement in their associated symptoms while receiving thyroid extract.

Underweight was the chief complaint of 7 patients in this series. After a sufficient trial of therapy with thyroid extract, 6 of these patients made excellent gains in weight and also noted considerable improvement in their general health.

Acne vulgaris is a frequent complaint in the student of college age. By no means all of the patients seen in this clinic with that complaint are treated with thyroid; however, a certain number of these patients have low basal metabolic rates and elevated serum cholesterol levels. Many of them have associated symptoms such as fatigue, and, in the female patients, menstrual disorders are common. Twelve such cases were treated with thyroid extract in conjunction with other measures frequently used in the treatment of acne. Definite improvement on this regimen was seen in 8 patients. In addition to improvement in the condition of the skin, the general health of nearly all these patients was improved.

The 41 patients grouped under the heading of "nervous symptoms" expressed a wide variety of complaints. Among these were headache, vertigo, tinnitus, palpitation, dyspnea, precordial pain, arthralgias, paresthesias, vaguely described gastrointestinal complaints, irritability, mental depression, and emotional upsets. Some of these patients complained of a tenseness in which they had a feeling that they were "going to explode." Such complaints are seen by the physician every day and are often attributed to anxiety or other forms of psychoneurosis. More often than not such a diagnosis is the correct one; however, the cases studied in this series are a selected group in whom the basal metabolic rates were subnormal and the serum cholesterol levels were somewhat elevated. Out of these 41 patients treated with thyroid extract, 22 patients, or 53.6 per cent, were definitely improved. Such subjective complaints are difficult to evaluate, and the question arises as to whether placebo medication might not have produced equally good results. This test was not attempted; however, it is believed that the proportion of patients improved here is greater than would have resulted from the use of placebos or suggestion by other means.

There were 7 women in this series who were suffering from menopausal symptoms associated with low basal metabolic rates and elevated serum cholesterol levels. Four of these women were definitely better after a trial of thyroid therapy. It is interesting that this group of patients should show serum cholesterol levels so much higher than those of the other groups studied. Epstein and Lande [16] performed studies of the serum cholesterol in 10 women undergoing menopause, and found them all to have normal basal metabolic rates, but noted a tendency to increases in the serum cholesterol values. Cantarow and Trumper [17] in their treatise on clinical biochemistry state that there is no significant alteration in the serum cholesterol at the menopause. No conclusions regarding this question can be drawn from our own investigation since only a small number of menopausal cases were studied, and these only because of suspected thyroid deficiencies.

In this study the question has arisen as to the importance of the level of the serum cholesterol in establishing the diagnosis of the milder thyroid deficiencies. To approach a rational answer to this question, all patients who had been treated with thyroid and upon whom serum cholesterol determinations had been performed, were divided into five groups as shown in Table 2. The criteria used in making this grouping were the basal metabolic rates and the levels of the serum cholesterol.

TABLE 2

Patient Groups According to the Basal Metabolic Rates and the Serum Cholesterol Levels

	B.M.R.	Serum Cholesterol
Group I	—15% or below	190 mgm.% or above
Group II	—10% to —14%	190 mgm.% or above
Group III	—15% or below	below 190 mgm.%
Group IV	— 9% or above	190 mgm.% or above
Group V	—10% to —14%	below 190 mgm.%

Table 3 shows the results of thyroid treatment upon each of the five groups. In addition the average basal metabolic rate and the average serum cholesterol level for each group is given. Figure 4 is a graphic representation of the results shown in Table 3. These data seem to indicate that the determination of the serum cholesterol level is a useful diagnostic aid in this condition. It would appear that any patient who falls into the classification of Group I, in other words has an elevated serum cholesterol combined with a low B.M.R., may be expected to show the best clinical response to thyroid therapy. It is further shown that the finding of an elevated serum cholesterol is of more significance than the finding of a low B.M.R. as is evidenced by the greater proportion of cases improved in Group II in comparison to Group III, and in Group IV as compared to Group V. Thus it is our belief that the serum cholesterol value should be obtained as well as the B.M.R. in all cases of suspected mild thyroid deficiency. Furthermore, it is our belief that those serum cholesterol levels from 190 to 250 mgm. per cent, while not always pathologic, are certainly to be considered as suggestive evidence of mild thyroid deficiency, especially in the presence of other findings.

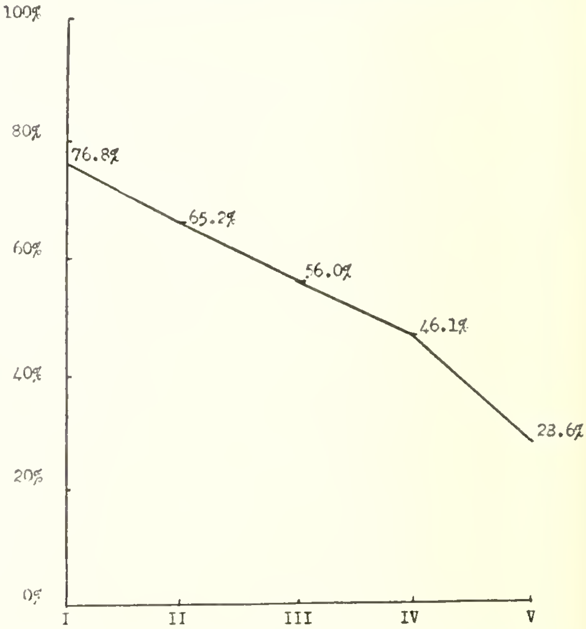
TABLE 3

The Relationship of the B.M.R. and Serum Cholesterol Levels to the Results of Thyroid Therapy

	Average B.M.R.	Average Serum Cholesterol	Number Treated	Number Improved	Percent Improved
Group I	—20.0%	243.4 mgm.%	69	53	76.8%
Group II	—12.5%	245.4 mgm.%	23	15	65.2%
Group III	—21.0%	160.0 mgm.%	25	14	56.0%
Group IV	— 7.0%	269.0 mgm.%	13	6	46.1%
Group V	—12.0%	170.0 mgm.%	7	2	28.6%

Hurxthal [18] has stated that the finding of hypercholesterolemia, when not explainable on any other basis, is a rational indication for a trial of therapy with thyroid extract. He has further stated that the finding of hypercholesterolemia in the absence of other causes points to

Fig. 4. The Relationship of the BMR and Serum Cholesterol Levels to the Results of Thyroid Therapy



On the abscissa are shown the patient-groupings based on the BMR and serum cholesterol levels as shown in Table 2. The percentage of patients improved on thyroid therapy is shown on the ordinate.

thyroid deficiency more than a low basal metabolic rate, and that the finding of both a hypercholesterolemia and a low B.M.R. renders the diagnosis extremely likely.

The results presented above seem to be in keeping with the work of Boyd and Connell[19] who reported studies of the plasma lipids in 35 cases of suspected mild hypothyroidism before and after treatment with thyroid extract. There were 19 cases who did not improve and 16 cases who did improve on treatment. In the 19 cases who did not improve the serum cholesterol values were nearly all well within the limits of normal, whereas, in the 16 cases improved by thyroid the serum cholesterol levels were most of them above 200 mgm. per cent. Interestingly enough, the average B.M.R. of the group which improved on thyroid treatment was not as low as the average B.M.R. of the 19 cases who showed no improvement.

Discussion

It appears from the results of our investigation that mild thyroid deficiencies are common among the people in the state of Kansas and the surrounding regions. The majority of the patients in this series were lifetime residents of Kansas, with a large portion of the remainder from adjoining states. According to a study of the iodine content in the water of various parts of the country published by McClendon and Hathaway[20] in 1924, there is a narrow strip less than 100 miles wide from north to south in the eastern part of Kansas in which the water has a low iodine content, less than 20 parts per million. These levels are the same as those found in the water of the so-called endemic goiter regions of this country. Perhaps this fact plays a part in the development of the condition studied herein.

Various workers[21,22,23,24] have shown on experimental animals that a high calcium intake in the diet, especially when the iodine intake is deficient, tends to aid in the production of colloid goiter. Reference to analyses of the calcium content in the water supplies of most of the municipalities in the state of Kansas, as determined by the Kansas State Board of Health,[25] shows that large areas of Kansas have extremely high levels of calcium in the water supplies. Whether this is a factor in the production of mild thyroid deficiencies can only be speculated upon at this point, especially since no one has ever shown calcium intake to affect the thyroid function in man.

Summary

1. The results are presented of a study of the clinical records of 505 consecutive patients upon whom basal metabolism determinations were performed at the Watkins Memorial Hospital of Kansas University during a 28 month period.

2. Most of the patients studied were college students from 14 to 30 years old. There were 291 patients, or 57.6 per cent of the total, who were females between 14 and 30 years of age.

3. There were 340 patients, or 67.3 per cent, who had basal metabolic rates of —10 per cent or below. It was found that 228 patients or 45.1 per cent had basal metabolic rates of —15 per cent or below.

4. Serum cholesterol determinations on 367 patients revealed 239 cases or 65.1 per cent, with levels of 190 mgm. per cent or above, and 76 cases, or 20.7 per cent, had levels above 250 mgm. per cent.

5. The most commonly noted clinical findings were fatigue, menstrual disorders, nervous symptoms, dry skin, brittle dry hair, thinning eyebrows and a tendency to obesity.

6. Thyroid extract was administered in average doses of 2 to 3 grains daily to 161 patients whose average B.M.R. was —17 per cent and the average serum cholesterol level was 226.9 mgm. per cent. Of these, 105 patients, or 65.2 per cent, were definitely improved on thyroid therapy.

7. An analysis of the results of thyroid administration for various individual complaints was made. Generally, the results of thyroid treatment were good.

8. An attempt was made to show the value of moderately elevated serum cholesterol levels in making the diagnosis of mild hypothyroidism.

9. The possible etiological relationships to mild hypothyroidism of low iodine and high calcium intake from the water of certain parts of Kansas is discussed.

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The Duration of Certain Phases of Sound in Blood Pressure Determination by the Auscultatory Method*

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In the determination of blood pressure levels by the auscultatory method, it is recognized that certain phases of sound usually can be differentiated. The point at which the initial, definite thumping sound begins represents the systolic pressure. Warfield[1] pointed out in 1913 that the diastolic pressure is more accurately represented by the level at which the sound changes from clear to dull and muffled, but this view is by no means universally accepted. Steele,[2] in 1942, compared auscultatory and direct intra-arterial measurements of blood pressure and demonstrated that the point at which all sound disappeared corresponded more closely to the diastolic pressure which he obtained in the radial artery. He found diastolic pressures measured directly averaged 0.8 mm. Hg. lower than the points at which all sound ceased when direct and indirect technics were applied simultaneously. Goldring and Chasis[3] have accepted Steele's findings and advocate the recording of diastolic pressure at the point of disappearance of sound.

The phases of blood pressure were described in 1911 by Goodman and Howell[4] as follows:

1. The initial thumping sound, average duration 14 mm. of mercury.
2. A murmurish sound, average duration 20 mm. of mercury.
3. A clear sound of 5 mm. average duration.
4. A dull and muffled sound of 6 mm. average duration.
5. Disappearance of all sound.

The pulse pressure is represented by the difference between the systolic and diastolic pressures. If the diastolic pressure is taken at the point of disappearance of all sound, the average pulse pressure would be 45 mm. of mercury according to Goodman and Howell. If the point at which the sound changes from clear to muffled is regarded as the diastolic pressure, the average pulse pressure would be 39 mm. of mercury.

Table: Mean Pulse Pressure and Mean Duration of Fourth Phase of Blood Pressure in 1897 University Students

Sex	Number of Cases	Mean Pulse Pressure	Range of Pulse Pressure	Mean Duration of Fourth Phase*	Range of Fourth Phase
Men	670	39.4	102-10	8.4	80-0
Women	1227	37.8	98-10	14.2	70-2
Total	1897	38.4	102-10	12.1	80-0

*Represents difference between the point at which the sound becomes dull and muffled and the point at which all sound disappears.

Since the reports of duration of blood pressure phases were made some time ago, on small numbers of patients, and largely of older age groups, it was considered worth while to reinvestigate the span of some of the phases of blood pressure as revealed by careful auscultatory determinations in a group of young adults. The group comprised 1,897 students at the University of Minnesota. The measurements were made with mercury sphygmomanometers with the subjects in the sitting position. The results are summarized in the table.

The pulse pressures ranged from 10 to 102 mm. mercury, the mean being 38.4 mm. which corresponds very closely to the average of 39 mm. according to Goodman and Howell.[4] The mean pulse pressure for men, 39.4 mm., was slightly higher than for women, which was 37.8 mm. of mercury. These pulse pressures are calculated to the point at which the sound changes from clear to muffled.

The average duration of the fourth phase, 12.1 mm. of mercury, did not conform to any of the earlier findings. An interesting result was the difference between the mean duration of the fourth phase in men and women. The average for men was 8.4 mm. and for women it was 14.2 mm. This sex difference apparently has not been mentioned in the earlier reports. There was a wide variation in the duration of the fourth phase as indicated by the range. This is consistent with the findings of other investigators. There was as much as 80 mm. difference between the point at which the sound becomes dull and muffled and the point at which all sound disappears. A range of this magnitude indicates the advisability of recording both points in all blood pressure determinations. Thus, if the blood pressure is recorded, for example, as 140/90-80 as recommended by the American Heart Association,[5] it is clear that the fourth phase begins at 90 and ends at 80 mm.

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*From the Students' Health Service, University of Minnesota.

Analysis of the data did not reveal any significant differences in the pulse pressures of the various age groups, nor were there any significant variations in the duration of the fourth phase with age.

Summary

1. The mean pulse pressure of 1,897 university students was found to be 38.4 mm. of mercury. The mean pulse pressure for men was 39.4 mm., and for women, 37.8 mm.

2. The average duration of the fourth phase of blood pressure was 12.1 mm. There was considerable difference in the mean duration of the fourth phase for men which was 8.4 mm. and for women, which was 12.1 mm.

3. The wide range of the fourth phase indicates the advisability of recording the beginning and the end points so that there will be no confusion as to the level of the diastolic pressure.

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AMERICAN STUDENT HEALTH ASSOCIATION NEWS

The 26th annual meeting of the American Student Health Association, held in Detroit, Michigan, on May 6, 7 and 8, was one of the most successful in the history of the Association; 183 in attendance and 22 new members. David D. Henry, Ph.D., President of Wayne University, Detroit, Michigan, presented a stimulating address. The papers were informative and interesting. From time to time they will appear in these pages and will later be incorporated in the Proceedings.

A completely new slate of officers were elected. They are as follows:

President: H. L. Marshall, M.D., University of Utah.

Vice President: L. B. Chenoweth, M.D., University of Cincinnati.

Secretary-Treasurer: L. W. Holden, M.D., University of Colorado.

Council members for term ending 1951: J. D. Farris, M.D., Emory University; Floyd Riggs, M.D., Indiana State Teachers College.

Administration Committee: F. M. Marty, M.D., Syracuse University, replacing W. E. Batchelder, University of New Hampshire.

Louisiana State University, New Orleans 13, Louisiana, is looking for a student health officer. They have a population of approximately nine thousand on the main campus, excellent facilities and an unusual opportunity for a man to develop a large and efficient service.

Dr. Edwin Fauver, after serving 29 years at the University of Rochester, retired July 1, 1946. He operates a boys' summer camp, Pemigewasset, New Hampshire, and vacations in Mexico or California winters and enjoys perfect health.

President W. E. Stevenson of Oberlin College, Oberlin, Ohio, writes that the position of Director of Student Health at Oberlin will be vacant starting next September. A minimum salary of $6,000 is offered.

MALARIA IN THE UNITED STATES

"This is now a retreating and diminishing disease," said Dr. Justice M. Andrews, of the United States Public Health Service, when he spoke on the "Present Proportions of the Global Malaria Problem in the Neartic Region" at the Fourth International Congresses on Tropical Medicine and Malaria at Washington from May 10 to 18. Dr. Andrews, now Deputy Director of the Communicable Disease Center at Atlanta told of the seriousness of malaria in the early pioneer days of America. "The Spanish, French, and British colonizations and the importation of negroes from Africa introduced large numbers of malaria infected individuals to North America.

"The infected descendants of these pioneers spread all over the country as a result of the Revolutionary and Civil wars and the increasing exploration and development of the Central and Western United States. Thus, by the middle of the Nineteenth Century malaria had spread throughout most of this country, except for the highlands and non-irrigated desert lands.

"It wasn't long, however," continued Dr. Andrews, "until the disease began to decrease in intensity in the northern part of the United States. This was due to the improved social economic conditions and the better standards of living. Among other factors which contributed to its decrease were agricultural drainage, cheaper quinine, and improved medical service. Thus by 1900 malaria areas were reduced to the southeastern coastal lowlands, the lower Mississippi flood plain, and a few localities in the southwestern United States."

Dr. Andrews then presented statistics as evidence to show that the death rate from malaria in the United States during 1946 and the cases of malaria reported during 1947 were about one fifteenth the figures for 1920. He attributes this marked decrease to the new insecticides, population removal from malarious to non-malarious areas, and anti-larval medication.

The influence of World War II on reported malaria prevalence in the United States was discussed and, Dr. Andrews pointed out, the relapses due to malaria acquired in other countries increased the reported case rates during the last four years, but this effect is vanishing rapidly. In closing his talk Dr. Andrews said "as far as can be ascertained, the presence of infected individuals throughout the country has not resulted in widespread transmission of the imported parasites. Such a possible consequence was feared and prudently publicized during the war. The author is aware of only a single instance in the northwest in which the probability of malaria transmission from a veteran is reasonably well established. Such dissemination could occur most readily in the southeastern states, but it would be exceedingly difficult to detect with certainty."

. . . MEET OUR CONTRIBUTORS . . .

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Editorial

EUTHANASIA — RIGHT OR WRONG?*

The public rightly assumes that physicians hesitate to speed release for the patient who is dying of an incurable disease. But many people favor legislation for voluntary euthanasia. When the Euthanasia Society conducted a survey, polling 4,000 New York State doctors, 80 per cent agreed that it is "a humane act" to shorten the life of an incurable patient who pleads with his physician to do so; and that the law should be amended to permit the administration of euthanasia by medical men under the jurisdiction of the courts.

No campaign to legalize the practice was launched during the war, but last December a committee of nearly 2,000 New York doctors, formed under the auspices of the Euthanasia Society of America, drafted such a bill for introduction in the state legislature. The bill makes no provision for those incapable of consent, such as mental defectives and grossly malformed infants.

A committee spokesman for the bill, Dr. Abraham L. Wolbarst, well known urologist, summed up for his colleagues by stating that to withhold euthanasia "against the expressed will of the sufferer is nothing but gross disservice, a condemnation of a cruel continuance of the living death . . . a denial of the physician's solemn obligation to relieve pain and suffering."

This view was also shared by fifty-four Protestant and Jewish religious leaders who jointly announced that, in their view, voluntary euthanasia is not at variance with moral and religious principles. And one New York newspaper called the bill "the most conservative and cautious approach to the problem . . . a proposal long needed by any modern code of laws."

The law proposed by the committee of New York doctors is remarkably simple, though its smooth operation would depend largely on its administration. Here is how it would work:

Suppose you are suffering severe pain caused by a disease for which no relief or recovery is known. If you are sane and over twenty-one you may *if you wish* apply to a court for euthanasia, accompanying your petition with an affidavit from your physician testifying that your sickness is incurable. The court appoints a three man board to investigate your case. Two of its members are doctors who check your physical condition to make sure that your own doctor has not erred in his prognosis. The third member, a lawyer, must satisfy himself that you signed the petition of your own free will and were not influenced by anyone. Thus serious obstacles are put in the way of malpractice; there is small chance of successful conspiracy between your doctor and your heirs to take advantage of the law by speeding your death.

If the board reports favorably to the court, a permit is granted, and three or four days later the three men visit you again. They ask you if you still desire euthanasia, for they realize that a patient racked by pain might make an impulsive, ill-considered request. They emphasize that you are at liberty to change your mind, since the law is of course permissive, not mandatory. You repeat you want "merciful release." Then, in the presence of the board, your physician or anyone of your own choosing quickly injects an overdose of morphine into your veins. The pain immediately recedes—you become drowsy and in a matter of seconds you drop peacefully into unconsciousness. Your torment is ended forever.

The Euthanasia Bill, whose medical sponsors include notable physicians and professors of medicine, is modeled on another which currently is being pushed in Britain for introduction in Parliament.

In the United States, the layman's opinion of legalized euthanasia is difficult to assess, though probably it is safe to say that a more lenient attitude exists today than at the turn of the century. As a subject for armchair debate, however, it rivals communism in its ability to evoke bitter words and hot tempers. Yet those who are against it on moral and religious grounds sometimes revise their stand when a particular mercy death case appeals strongly to their sense of humanity.

Organized opposition to euthanasia is most vocal and probably most powerful in clerical circles which call it murder, plain and simple. A strong undercurrent of resistance also exists among some medical men. Their chief objection is that it would shatter public confidence in the medical profession, weaken the resolve of medical scientists to seek cures, and stigmatize every doctor who practiced it. The answer here is that there is nothing in the bill to *compel* a doctor to handle a case if his moral and ethical scruples forbid him. He may turn over the patient's request to a court, which then will provide a doctor who approves of the law. Moreover, there will be no more criticism attached to the administration of lawful euthanasia than there is now to a doctor who performs a legal abortion to save a woman's life or sanity.

INTERNATIONAL SOCIETY OF HEMATOLOGY

The International Society of Hematology will hold its bi-annual meeting at the Hotel Statler, in Buffalo, New York, August 23-26, 1948. Applications for the presentation of scientific exhibits are now being received by Dr. O. P. Jones, Department of Anatomy, University of Buffalo, Buffalo, New York. Chairman of the Program Committee is Dr. Ernest Witebsky, Buffalo General Hospital, Buffalo, New York.

All scientific sessions and exhibits will be open to scientists interested in hematology. Communications and applications concerning membership from this country will be received by Dr. William Dameshek, 25 Bennett St., Boston, Massachusetts. Those interested in attending the meeting may communicate with Dr. Sol Haberman, Secretary, The William Buchanan Blood Center, Baylor Hospital, Dallas, Texas.

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*Excerpts from an article by the same title in *Survey Graphic*, May, 1948, by Selwyn James, a former reporter for the *Manchester Guardian*, now an American citizen, a teacher at the New School for Social Research, and a free-lance writer.

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News Items

NORTH DAKOTA

Dr. Robert S. Woodward of Jamestown is now associated with the Jamestown Clinic.

Dr. Woodward was graduated from Creighton University Medical School, receiving his M.D. degree in 1943.

He had an internship and 18 months residency in internal medicine at Anker hospital, St. Paul, Minn., where he was assistant superintendent for a time.

He served active duty with the U. S. navy medical corps from April 1946 to December 1947, at U. S. Naval Hospital, St. Albans, N. Y., where he was in charge of a medical ward. Since his discharge from the navy he has taken training in radiology.

Dr. W. C. Hurley, who now is completing a postgraduate course in medicine at Georgetown university, Washington, D. C., has purchased the practice and office equipment of the late Dr. R. T. O'Neill in Minot and will begin practice on July 1.

Graduate of Minot high school in 1932 and of Georgetown medical school in 1942, Dr. Hurley spent five years in the navy medical corps, serving in the Pacific.

Announcement of the resignation of three members of the teaching staff of the University school of medicine has been made by Dean Alfred H. Lawton.

Dr. Lloyd S. Ralston, assistant in the department of pathology, will go to Larimore to begin general medical practice.

Dr. Leslie C. Lundsten, instructor in the school of medicine, has resigned to go to the Veterans Administration hospital in Hinsdale, Ill., for residency work in internal medicine.

Dr. Oswald P. Erickson, assistant professor of physiology and pharmacology, will take up residency work in the field of radiology. He has not announced where he will continue his work.

Dr. Robert M. Fawcett, who has been affiliated with the Mayo clinic in Rochester, Minn., for seven years, has joined the medical staff of the Lake Region Clinic, Devils Lake. He will be associated with his brothers, Drs. John C. Fawcett and Donald W. Fawcett, and Dr. John D. Graham and Dr. Edward A. Jones.

The Walsh county town of Fordville will take a day off this summer to honor its community doctor.

Committees have been appointed to plan a community celebration on June 20 in honor of Dr. C. E. Lommen, who has served this area for 36 years.

A two-year experiment in cooperative medicine was acclaimed successful by Dr. O. A. Sedlak, president of the Cass County Medical Society in Fargo on May 4.

SOUTH DAKOTA

South Dakota now has more physicians licensed and practicing than at any time since 1940, the Board of Health disclosed in May.

The state has 428, compared with 474 in 1940 and 339 in 1945, the low for the last 20 years, the board said. There were 414 last year.

The board announced that 122 South Dakota doctors served in the last World War. There were 80 in World War I. Thirty-three of those who left to serve in the last war have returned to practice in South Dakota.

Physicians who have specialized their practice include 53 surgeons, 19 internal medicine, 17 eye, ear, nose and throat, 14 obstetrics, 11 women's disease, nine bone surgery, nine eye ailments, eight children's diseases, six X-ray pathology, two tuberculosis and two public health.

Ninety-nine of the state's physicians are 40 to 49 years old, and 90 are between 30 and 39. Twenty-three are under 30 and 16 are 80 or more.

The board said 24 practice on a part-time basis and 13 are retired.

Dr. J. D. Bailey of Rapid City was elected president of the South Dakota Mental Health Association in April.

The South Dakota Tuberculosis Association has granted $3,000 to the state division of vocational rehabilitation for work with tuberculosis victims, superintendent of Public Instruction J. F. Hines announced. The grant, to be matched with federal funds, will provide the division with $6,000 for rehabilitation services from persons disabled by tuberculosis.

Dr. William J. Morrissey, formerly of Omaha, has joined the medical staff of Drs. S. A. Donahoe and G. I. W. Cottam in Sioux Falls.

Dr. Morrissey is a 1943 graduate of the Creighton university medical school. He served his internship at DePaul hospital, St. Louis, Mo., and had a two-year fellowship in internal medicine at St. Louis county hospital. He spent two years in the army—one year at Madigan General Hospital, Ft. Lewis, Wash., and one year as chief of medical service at Ft. Laughton medical hospital, Seattle, Wash.

Dr. J. V. Carroll, formerly of Cleveland, Ohio, has established practice in Tyndall. Dr. Carroll received his M.D. degree from St. Louis University, and his B.S. degree from Cornell University. He spent three years in the medical department of the army, and then took eight months of training in obstetrics. He then entered the navy where he has received two years of surgery. He is now on terminal leave from the navy.

Dr. R. B. Fleeger of Lead, director of the Homestake Mining Company Hospital, was appointed in April to the medical panel of the South Dakota occupational disease disability law administration.

He was one of the three South Dakota physicians appointed by Governor George T, Mickelson.

Appointed with Dr. Fleeger whose term expires July 1, 1949, were Dr. Donald H. Breit of Sioux Falls for a term ending July 1, 1951, and Dr. J. L. Calene of Aberdeen who will serve until July 1, 1953.

Establishment of the firm of Drs. Totten, Steiner and Smith in Lemmon was announced April 21 by Dr. F. C. Totten, senior member and pioneer Lemmon physician and surgeon. The partnership was effective April 1.

Dr. John Hermanson, formerly of Peoria, Illinois, has located in Valley Springs.

Dr. Richard Thue, Madison, was elected vice-president. Dr. John Uglum, Mitchell, was re-elected treasurer, and Dr. Ralph Wick, Rapid City, secretary.

MINNESOTA

Drs. Erling S. Platou and Richard B. Tudor of Minneapolis announce the association of Dr. Allan J. Hill and Dr. Albert J. Schroeder in the practice of pediatrics.

The 50th anniversary of the establishment of Psi chapter of Alpha Kappa Kappa, professional medical fraternity at University of Minnesota, was observed at a dinner at the Minneapolis Athletic Club. More than 100 alumni attended, including four of the original organizers, Drs. Wm. H. Condit and Samuel E. Sweitzer of Minneapolis; Chas. B. Lenont of Virginia, Minn., and N. O. Ramstad of Bismarck, N. D.

Dr. Viktor O. Wilson, 1539 E. River terrace, divisional chief of special services in the state department of health, has resigned his position, effective May 15. He will become city health officer in Rochester, Minn.

Dr. Clarence W. Wasmund, a native of Brooklyn, N. Y., has joined the medical staff of the Interstate clinic at Red Wing as head of the eye, ear, nose and throat department, it was announced this week. Dr. Wasmund received his M.D. at Long Island College of Medicine at Brooklyn and interned at King's county hospital there. He also taught at Long Island College and did eye research at the same institution.

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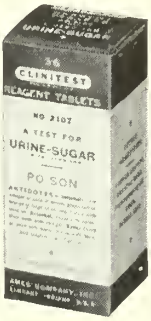

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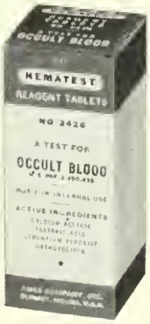

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At the recent annual meeting at Madison, Wis., of the American Association of Anatomists, Dr. A. T. Rasmussen, professor of anatomy at the University of Minnesota, was elected to the position of vice president, and Dr. Edward A. Boyden, chairman of the University's anatomy department, retired as first vice president.

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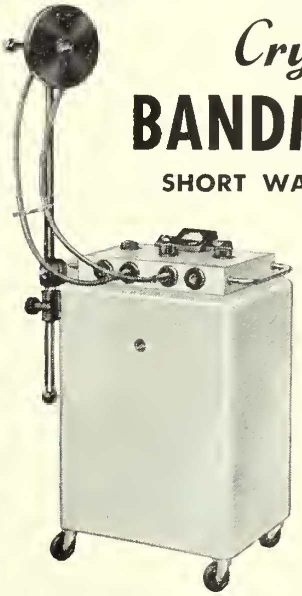

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Deaths

Dr. O. V. Opheim, 62, Sioux Falls, S. D., physician and surgeon for 20 years, died April 28 in Sioux Falls. He also practiced at Starbuck, Minn., for 14 years.

Dr. John Greenfield, 72-year-old physician and surgeon, died in Sioux City, Ia., on April 20. He had been a resident of Avon, S. D., since 1903.

Dr. Raymond W. Mullen, 69, a Sioux Falls physician since 1918, died April 29 in Sioux Falls.

(Continued on page 258)

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The JOURNAL LANCET

Minneapolis, Minnesota
July, 1948

Vol. LXVIII, No. 7
New Series

Tendon Graft Replacement of the Finger Flexors

Robert E. Van Demark, M.D.
Sioux Falls, South Dakota

The grasping and holding power of the fingers is dependent on the integrity of the flexor tendons; injury to the latter structures seriously impairs these basic functions of the hand. The unaffected thumb can no longer be properly opposed to the finger tips; this is particularly incapacitating when the flexor tendons of the index and middle fingers have been severed. Prompt repair of the affected tendons may not be followed by good motion, since the tendons may become adherent to the adjacent tissues. The use of free tendon grafts constitutes a valuable adjunct in both early and late treatment in properly selected cases. Too frequently a finger is left to become stiff or even amputated because it is thought that it can no longer serve any useful function.

Certain local conditions are necessary for tendon grafting, including pliable overlying skin and subcutaneous tissue, and the absence of potential or actual infection. To be worthy of a graft a finger must demonstrate good passive motion. This can be achieved in most instances by the use of physiotherapy, providing the joints have not been injured or become ankylosed. Circulation in the affected fingers also must be adequate; strangulating scar tissue should be replaced by a small pedicle graft from the abdominal wall. In old reconstructive cases it has been our usual procedure to suture severed nerves prior to repairing or replacing the tendons, since the tissue atrophy associated with nerve loss is not conducive to the proper healing of wounds, good joint motion and pliability of the skin and subcutaneous tissues.

An adequate source of supply for a graft is always available. The extensor digitorum longus tendons of the toes can be sacrificed with no disability since their function is adequately assumed by the extensor digitorum brevis. The palmaris longus tendon is available in 80 per cent of individuals; in certain cases in which a flexor digitorum sublimis tendon is removed, it can be used for a graft.

Tendon grafts, like bone, undergo an early central avascular necrosis on transplanting; however, the tendon becomes vascularized more rapidly and after a period of four to five weeks has considerable strength. During the period of vascularization the graft is swollen; later, it contracts and resembles a normal tendon both grossly and microscopically. Because of this contraction the length of a graft must be slightly longer than normal. With usage, the graft becomes gradually stronger to meet the function placed upon it.

In late tendon repairs where the divided ends of the tendon can no longer be approximated, tendon grafts may be used to bridge the gap. Likewise, in recent injuries, tendon grafts may be used in case of irrepairable damage or loss of a segment of tendon. By means of a careful atraumatic technique satisfactory results can usually be obtained with early tendon suture in case of severed tendons over the middle phalanx and proximal to the metacarpal head. In contrast, poor results of tendon suture are frequently seen with division of the flexor tendons in their narrow canal extending from the distal palmar crease to the proximal interphalangeal joint. Usually the profundus tendon, which attaches to the base of the terminal phalanx, is sutured; the distal segment of the sublimis tendon then becomes adherent to produce a flexion contracture at the proximal interphalangeal joint[1] while the profundus tendon becomes adherent at its line of suture to the adjacent tight sheath. It is in this region that tendon graft replacement is most

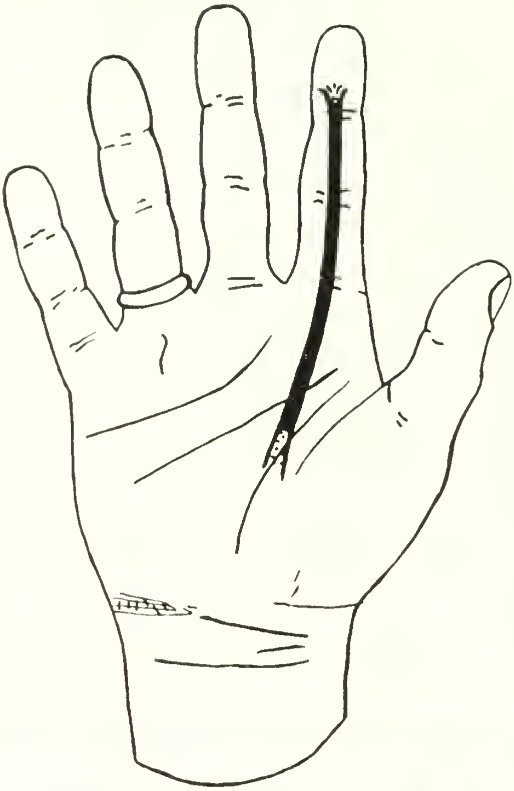
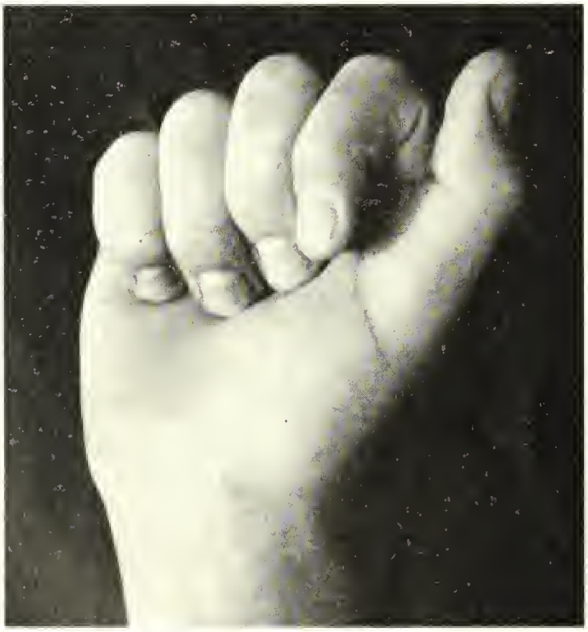


Fig. 2. The length of the tendon graft is shown in black.

useful. Through a midlateral incision the distal tendon fragment in the finger is exposed, care being taken to preserve intact the remaining annular ligaments which hold the tendons immediately anterior to the bony phalanges. Not only must the distal segment of the divided profundus tendon be removed, but also that of the sublimis, if future adhesions are to be prevented. If the sublimis tendon, attaching at the sides of the middle phalanx, is left too long a flexion contracture occurs at the proximal interphalangeal joint, while if it is divided too short the joint will hyperextend.[1]

Following removal of the distal fragments the tendons are exposed well proximally in the palm, with due respect for the digital nerves and vessels. The graft is then firmly attached to the base of the terminal phalanx of the finger, passed under the intact or reconstructed annular ligaments to the palm where it is sutured to the tendon of either the profundus or sublimis (Fig. 2). This point of suture must be well proximal to the narrow digital canal. Either silk [3] or withdrawable stainless steel wire [2] may be used as suture material. Gentle application of firm pressure dressings insures absolute hemostasis postoperatively when the hand is dressed with the wrist in flexion. This position should be continuously maintained for four weeks.

Function after careful tendon graft surgery is dependent almost entirely on the active efforts and cooperation



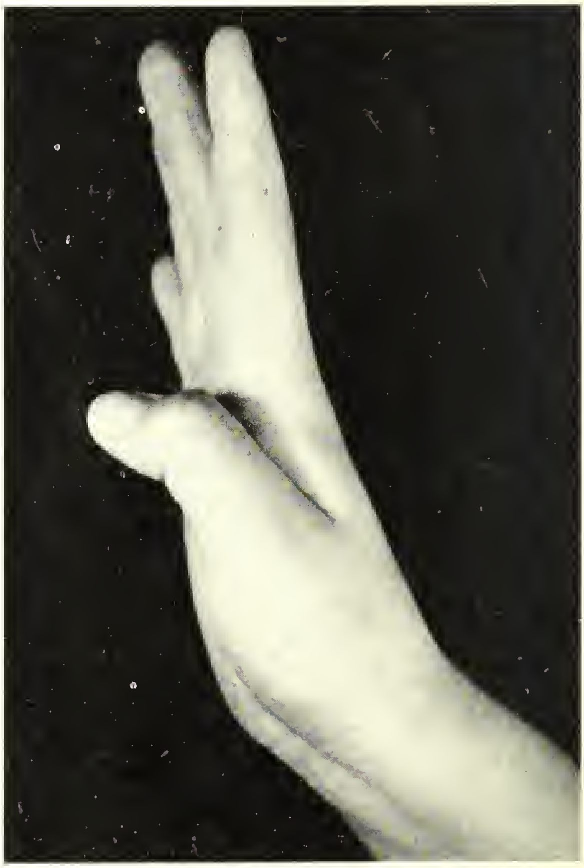


Fig. 1, *a-b*. Flexion and extension of the right index finger present nine months after flexor tendon replacement by the long extensor tendon of the left fourth toe. Two months prior to operation the patient had suffered a deep penetrating wound over the metacarpal head, dividing both flexor tendons. This postoperative result was achieved solely by the active efforts of the patient who lived in a community where the services of a physiotherapist were not available. (Case Presentation at McKennan Hospital Clinic Day, Nov. 25, 1947.)

of the patient. Not only must he have a sincere desire to use the affected member but he must regularly and continuously transmit this desire into action; he must conscientiously exercise at frequent intervals throughout the day (Fig. 1, *a-b*). The encouragement of others, while helpful, is not sufficient to establish normal function if the patient has not an earnest desire to exercise. In such individuals the efforts of the surgeon are utterly wasted. An essential which must never be disregarded is a careful preoperative evaluation of the patient's desire to get well, his dependability and his environment.

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NEW OFFICERS ELECTED AT RECENT MEETINGS

Minnesota State Medical Association

Dr. Ernest M. Hammes, Sr., of St. Paul, was elected president of the Minnesota State Medical Association June 7 in the opening session of the association's 95th annual convention in the Minneapolis Auditorium. Dr. Hammes will assume office January 1, 1949. He will succeed Dr. Archie E. Cardle of Minneapolis.

Dr. Benjamin B. Souster, also of St. Paul, was re-elected secretary. Other officers named are: Dr. Charles E. Proshek, Minneapolis, first vice president, and Dr. A. E. Sohmer, Mankato, second vice president. Dr. William H. Condit, Minneapolis, was re-elected treasurer. Dr. Charles G. Sheppard, of Hutchinson, was re-elected speaker of the house of delegates of the association and Dr. Haddon M. Carryer, Rochester, was re-elected vice speaker. Dr. John A. Bargen, also of Rochester, was named delegate to the American Medical Association.

North Dakota State Medical Association

Dr. W. A. Liebeler, Grand Forks, was elected president of the North Dakota State Medical Association at the meeting of the House of Delegates held May 23 in Jamestown.

Dr. W. A. Wright, Williston, is president elect; Dr. L. W. Larson, Bismarck, first vice president; Dr. W. E. G. Lancaster, Fargo, second vice president; Dr. A. P. Nachtwey, Dickinson, speaker of the House of Delegates; Dr. A. O. Sedlak, Fargo, was re-elected secretary; Dr. E. J. Larson, Jamestown, was re-elected treasurer; Dr. J. H. Moore, Grand Forks, is delegate to the American Medical Association and Dr. G. W. Toomey, Devils Lake, is alternate.

Dr. A. D. McCannel, Minot, was re-elected councillor for the fourth district; Dr. C. J. Meredith, Valley City, for the fifth district and Dr. E. J. Schwinghamer, New Rockford, for the ninth district.

Members recommended for the state board of examiners which will be submitted to the governor are Dr. O. W. Johnson, Rugby; Dr. Sedlak and Dr. R. B. Radl, Bismarck. Dr. Larson was named a member of the medical center advisory board.

Analysis by Decades of Morbidity and Mortality Trends in the Northwest Central Area

One Year's Report of Autopsy Findings (June 1, 1946 to May 31, 1947)

George Berdez, M.D.[*] and John J. McLeod, Jr., M.D.[†]
Duluth, Minnesota

BEFORE a recent Public Health Assembly in Indiana, where the diseases of older age were under discussion, a speaker led off with this challenging statement: "Among the group represented here at this meeting, it may be definitely stated that one in six will ultimately die of cancer." Such a statement is never made with the primary intent of instilling concern, and it rarely does any harm because within the audience there are few, indeed, who accept their personal appointment to the ill-fated assignment. The law of averages is difficult to apply to a collection of individuals, since each person assumes exceptional consideration on the part of fate and circumstance. Other defenses arise based upon the assumption: "but such things are not happening either in my locality or among my family connections; we are not oppressed by the things that are happening to our fellows elsewhere."

We present these tables and analyses both for the informative and timely data they portray, but especially for the doctors in these northern portions of three mid-central states, as indicating the trends among their patients, not only as to mortality considerations, but morbidity as well. It will be noted for example with cancer, that the general statistics for the United States apply unerringly in this north-central region as well, regardless of what we may say about salubrity, lack of crowding, individual sturdiness and adaptability. This considerable series (347) of autopsies as shown in Table 1 (a total of 54 cancers or 15.5 per cent) is almost exactly what the forementioned speaker said—one in six!

TABLE 1
Summary by Decades of 347 Autopsied Individuals

Age	Number		Percent
0 to 9	27		8.1%
10 to 19	8		2.3%
20 to 29	10		2.9%
30 to 39	18		5.2%
40 to 49	26		7.2%
50 to 59	54		15.6%
60 to 69	92	Approximately	26.4%
70 to 79	69	75%	20.0%
80 to 89	41	of Total	11.8%
90 to 99	2		0.5%

Similarly striking statements may be made about the life extension in our country, which is molding us into "a nation of elderly people." The listings by decades, thus so amply attest. Table 1 shows that approximately 75 per cent died after attaining the beginning of the sixth decade; nearly half after the beginning of the seventh decade, with nearly 12 per cent after the ninth decade. Simm's figures seem to hold consistently. A 10- to 12-year-old American boy is the most death-resistant among living human beings. We have found less than 3 per cent dying in the second and third decades, and only 5 per cent in the fourth decade.

Accidents begin to mount within the second decade, with suicides and alcoholism obtruding in the third and fourth. The type of accidents in the later decades begin to stem less from violent or unfavorable living than from the decay incidental to bodily involution, such for example as the classical hip fracture in the elderly woman with death from fatty pulmonary emboli. We have elected not to introduce much detail in terms of individual primary or secondary causes of death, and to comment on a few diagnostic therapeutic or social implications derived either from a perusal of the main categories or an analysis of specific items. Suffice it to say that aside from immaturity and prematurity, congenital inadequacies, neglect and an occasional infection, few young children die. At the opposite pole of life, economic adversity and neglect would appear to be a large factor, as for example in those living alone, with inadequate care, sometimes the result of a stubborn zeal to live an independent hermit existence in terms of which the aging body is pitted against hopeless odds.

A percentage listing of the deaths by decades is a routine which has been favored by those making monthly mortality reports before our hospital staffs. Some brief comments are made after each table to identify items significant in terms of incidence and degree of inevitability. Consistent efforts at reducing the incidence of industrial accidents have proven that much may be accomplished. It is debatable as to how much may be accomplished in the prevention of suicides, but there can be no possible argument over the need of stressing more means of lessening accidents on the highway, in the home and on the farm. While such efforts do not concern the medical profession anymore than other groups and society as a whole, a situation such as death from a ruptured peptic ulcer or hemorrhage from a tubal pregnancy, call not only for alertness on the part of doctors, but attention by lay people to induce them to seek medical care in time; and obviously a corollary of that is to have medical attention and hospital facilities available.

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The autopsies have all been done by the senior author (G.B.). The work of compilation and assistance in classification and arrangement by the junior author ((J.J.McL.).

A Listing of Deaths by Decades

First Decade (0 to 9 years). A total of 27, or 8.1 per cent. Prematurely 4, brain hemorrhage 3, adrenal hemorrhage 2, asphyxia 2, congenital hearts 2, fetal atelectasis 2, hydrocephalus 1, congenital hydrops 1. This makes a total of 17, or nearly two-thirds of this group, where birth deficiencies and accidents made life untenable or terminated it. The remaining one-third was made up of 4 traumatic (accidental) deaths, with one each of poliomyelitis, meningitis, chronic nephritis, impetigo (and neglect), abscess of the thymus and enterocolitis.

Second Decade (10 to 19 years). A total of 8, or 2.3 per cent. Three accidents, two instances of poliomyelitis, one of an early neuroblastoma, one each of acute nephritis and a young boy dying of lipid infiltration of the tissues in general, with decisive coronary failure after closure, makes up this limited category.

Third Decade (20 to 29 years). A total of 10, or 2.9 per cent. Two each of cerebral hemorrhage (one a precocious hypertension and the other an aneurysm) and suicide begin to introduce the death causes that mount so rapidly in later decades. One each for pulmonary tuberculosis, epilepsy, poliomyelitis, alcoholism, pulmonary edema and ruptured ectopic pregnancy complete this list. At this particular period poliomyelitis has been the most fatal acute transmissible disease.

Fourth Decade (30 to 39 years). A total of 18, or 5.2 per cent. Exactly one-half of this list is made up of accidents, 5, and alcoholism, 4, whereas cardiovascular disease provides 3 more (2 coronary occlusions, and there was one ruptured cerebral artery aneurysm). One malignancy appears (carcinoma of the cervix) and one death each arose from leukemia, chronic nephritis, tuberculosis, brain abscess and pulmonary embolism occurring in pregnancy.

Fifth Decade (40 to 49 years). A total of 26 cases, or 7.2 per cent. Slightly less than one-fourth of this list is made up of heart disease. Five of these were classified as hypertensive disease, and one each as coronary occlusion and aortic stenosis. None of these were ascribed to a rheumatic or infectious background. Malignant neoplastic disease (cervix, lung and parotid), accidents and alcohol (well associated) took off as many as cardiovascular disease. The list follows with one each of a considerable variety: Lobar pneumonia, tuberculosis, suicide, torsion and gangrene of small intestine, meningitis, pernicious anemia, ruptured peptic ulcer, Alzheimer's disease, anuria after sulpha medication and a postoperative peritonitis after cholecystectomy.

Sixth Decade (50 to 59 years). A total of 54 cases or 15.6 per cent. Cardiovascular disease and cancer accounted for over two-thirds of the list, as this age level registers the geriatric phases of decrescent and neoplastic bodily tendencies. Where death followed a definite coronary thrombus with resultant myocardial infarction as it did seven times, the arteriosclerotic or hypertensive association in these patients assumes a subordinate rate. However, if no coronary thrombus is found (often the case), but the enlarged heart and narrowed coronaries together with the state of the general blood vessel system induces the necropist to give "arteriosclerotic and/or hypertensive disease" as the primary cause, the precipitating factor may still be "coronary inadequacy." Only one case of syphilitic aortitis was found. Aortic stenosis (likely decrescent, and a not uncommon present-day finding) and dissecting aneurysm of the aorta each occurred once in this decade. A listing of the cancers for the entire group with the organs of origin is presented in Table 2. As to the remaining causes of death, suicides, 2, accidents, 6, and alcoholism, 3, continue to obtrude, but an unusual note of warning to keep in mind: even among the aged, the possibility of a most dread disease of yesteryears—2 deaths in this decade from overlooked and neglected diphtheria! Three of the elderly group died of tuberculosis, an event which lends support for the mass chest X-ray survey currently in progress. Four deaths occurred from what we may group under "non-malignant surgical gastro-intestinal emergencies."

Table 2

The Incidence of Malignancy

Site	Number	Percent of Total
Stomach	8	15.0%
Large intestine and rectum	7	13.0%
Prostate	7	13.0%
Lung	6	11.4%
Cervix	3	6.0%
*Leukemia	3	6.0%
*Hodgkin's Disease	2	3.6%
Ovary	2	3.6%
Pancreas	2	3.6%
Esophagus	2	3.6%
Bladder	2	3.6%
Gallbladder	2	3.6%
Duodenum and ampulla	2	3.6%
Breast	2	3.6%
Vertebra	1	2.2%
Fundus of uterus	1	2.2%
Kidney	1	2.2%
Total	54	15.5%

* Included in tabulation because the end result and unknown etiology entitle them to this association: while not cancer in the strict sense of the term, they proceed to death in malignant disorder.

Seventh Decade (60 to 69 years). A total of 92 cases, or 26.4 per cent. As the totals climb, cardiovascular disease and cancer accounted for 54.3 per cent of the

Table 3

Cardiovascular Disease

97 Cases, or 28 Percent of the Series

Hypertensive cardiovascular and/or arteriosclerotic	56
Coronary occlusion and/or inadequacy	21
Aortic stenosis (with calcific valves)	9
Pericarditis	7
Congenital heart	2
Syphilis	2
Total	97

TABLE 4
Accidental Deaths by Decades and Causes
54 Deaths or 14.7% of the Series

People under 50	1st decade—4 deaths
	2nd decade—3 deaths
	3rd decade—0 deaths
	4th decade—5 deaths (2 drowning, 2 industrial, 1 automobile)
	5th decade—4 deaths (1 freezing, 2 automobile, 1 industrial)
People over 50	6th decade—6 deaths
	7th decade—17 deaths (4 miscellaneous, 2 home, 4 industrial, 5 automobile, 2 falling)
	8th decade—9 deaths (5 automobile, 4 otherwise)
	9th decade—4 deaths

deaths. But the decade produced a wide variety of new as well as previously encountered entities. For instance, accidental deaths (and they deserve a special listing in Table 4) jumped to 13, or 14 per cent. Non-tuberculous pulmonary disease (often terminal) rose to 11, or 10.5 per cent. The remainder included genito-urinary and gastro-intestinal infection, obstruction, etc.

Eighth Decade (70 to 79 years). A total of 69 cases, or 20 per cent. There is no essential change in trends from the previous decade, except that the percentage of combined heart disease and cancer advanced from 54.3 to 76.9 per cent! Accidents took 9 lives. Genito-urinary infection (prostatism) appears, as do malnutrition, osteoporosis and cirrhosis of the liver. Pityriasis rubra adds a euphonious title, and luetic aneurysm appears again, 68 strokes, and four instances of pericarditis were found, but no lobar pneumonia.

Ninth Decade (80 to 89 years). A total of 41 cases, or 11.8 per cent. The two major causes of death (heart disease and cancer) have receded a meager 4 per cent. Aortic stenosis with calcification (4, or 20 per cent) showed the degree to which this organic valvular disease, as shown in this list, has displaced other valve lesions. Genito-urinary infection is noted again with two instances of cystopyelonephritis and one of a ruptured bladder diverticulum. Prostatism in the male and metastatic carcinoma in the female are two common sources of genito-urinary sepsis.

Tenth Decade (90 to 99 years). A total of two cases, or 0.5 per cent. Chronic cystopyelonephritis for one, and decrescent arteries for the other.

We present in Tables 1 to 4 a listing of the major causes of death and by inference some of the associated circumstances. It must be recognized that especially in the older age groups a multiplicity of anatomical or other defects are shown up at all routine autopsies. A separate listing of some of these would bring to the fore the late physiological maladjustments that so often obtain, such as terminal pneumonias, phlebothromboses, or general sepsis.

AN OVERALL APPRAISAL

1. Seventy-five per cent of a series of autopsy examinations on 347 individuals, in one year, were made on people over the half-century mark.

2. The present emphasis placed upon geriatric decrescence and malignancy is well justified by the listings charted.

3. The table of accidental deaths shows convincing evidence of the need of support for campaigns (home, industry, highway, and factory) aimed at accident prevention.

4. Not only is the incidence of transmissable disease declining as a cause of death in early age (note the absence of obvious rheumatic heart disease and the finding of calcareous aortic disease) but infection in old age is subject to control.

N. J. NESSA, M.D.

1880 - 1948

Dr. N. J. Nessa, 68, Sioux Falls, South Dakota, who pioneered in the use of X-ray and radium in the midwest, died July 1 in a Rochester, Minnesota, hospital.

Dr. Nessa was graduated from the University of Minnesota in 1904 and practiced at Brewster, Minnesota, for four years before going to South Dakota. He helped found the Sioux Falls clinic in 1919. He became interested in X-ray work in World War I, when he was a lieutenant in a medical division. Dr. Nessa started to work with radium in 1940.

He was a member of the American Board of Radiology, the American College of Radiologists and the American Roentgen Ray society. He was president of the South Dakota Medical Association in 1943. Dr. Nessa was a staff member of Sioux Valley and McKennan hospitals in Sioux Falls until six weeks before his death.

Survivors are his wife, Florence, Sioux Falls; a daughter, Virginia Nessa, Warren, Pennsylvania; two sons, Neil, a Pan-American Airways pilot, and Donald, Chicago; a sister, Mrs. Mamie Nass, Mabel, Minnesota, and a brother, Otto Nessa, Osseo, Wisconsin.

A Study of the 1946 Poliomyelitis Epidemic by New Bacteriologic Methods

Edward C. Rosenow, M.D.*
Cincinnati, Ohio

A review of results of previous studies made by others and myself on the importance of a specific type of streptococcus in the etiology of poliomyelitis, and by myself on the relation of the streptococcus to the filterable virus and references to the original reports have been set forth in a monograph.[1]

Owing to the widespread occurrence of poliomyelitis during the summer of 1946, the exhaustion of the supply of the poliomyelitis antistreptococcus serum with which diagnostic and curative action had been obtained,[1] and because of the encouraging results I have had in the preparation and use of artificial antibody[2,3] in the diagnosis and treatment of other diseases due to or associated with specific types of alpha streptococci, I could not do otherwise than again study this still unsolved problem from the streptococcal and viral standpoint by the use of new methods.

Persons suffering from poliomyelitis studied by me in 1946 were being cared for in hospitals in Cincinnati, Ohio, Madison, Wisconsin, Rochester, St. Paul and Minneapolis, Minnesota, Rockford and Chicago, Illinois, and Cleveland, Ohio. The diagnosis was made by the respective attending physicians.*

Methods

Serial dilution cultures[4] were made in dextrose brain broth from washings of nasopharyngeal swabbings of persons suffering from poliomyelitis, from contacts and non-contacts, and from NaCl solution washings of bronze turnings which had been exposed to outdoor air in glass tubes with screened ends on the hood of an automobile driven from 50 to 300 miles for different samplings in and outside of the epidemic zone.[7]

The swabbings of the nasopharynx were made from behind and above the soft palate without touching the tongue with aluminum wire wrapped swabs bent to a suitable angle. The material thus obtained was washed off in 2 ml. of a 0.2 per cent Gelatin-Locke solution and 0.15 ml. of the washings was inoculated with a 1 or 2 ml. pipette into the first of a series of six tubes, each containing 15 ml. of dextrose brain broth. 0.15 ml. was then transferred and thoroughly mixed with the same pipette in rapid succession from tube to tube through the series. A like amount of the undiluted saline washings was inoculated on the surface of a blood agar plate. All cultures were incubated at 33° to 35° C.

Pure cultures of the streptococcus were selected for study, not from colonies of the primary growth on blood agar plates but from the end point of growth of serial dilution culture in dextrose brain broth. This usually occurred in the fourth, fifth, or sixth tube of the serial dilutions from nasopharyngeal swabbings and in the second to the fourth dilutions from the washings of the bronze turnings which had been exposed to outdoor air.

Mice were inoculated intracerebrally in the right frontal lobe while under ether anesthesia with 0.03 ml. of 10 to 1 NaCl solution suspensions of the primary pure culture of the streptococcus from the end point of growth in the serial dilution cultures in dextrose brain broth, and large volumes 3500 ml. of freshly prepared 0.2 per cent dextrose broth contained in bottles of 4 liter capacity were inoculated usually with the second or third subculture. The young 4 to 8 hour culture in tubes of dextrose brain broth containing 15 ml. was inoculated into each of the large volumes of dextrose broth. After incubation, usually over night, the growth was harvested in the bowl of a continuous feed supercentrifuge and the putty-like mass of the centrifugated organisms from the inside of the bowl was suspended in glycerol 2 parts and saturated NaCl solution 1 part, so that each ml. contained approximately 1000 billion organisms, or the growth from 500 ml. of dextrose broth.

Two types of artificial antibody were used in cutaneous and agglutination tests and for therapeutic injection. One was prepared by autoclaving at 17 lbs. pressure, NaCl solution suspensions containing 20 billion streptococci per ml. for 96 hours,[2] the other by autoclaving suspensions containing 10 billion streptococci per ml. but for 1 to 3 hours after adding 1.5 per cent H_2O_2.[3] For cutaneous tests the former was diluted with an equal volume of NaCl solution containing 0.4 per cent phenol, and the latter was used undiluted after neutralizing with sodium hydroxide and adding 0.2 per cent phenol. The former type of antibody was used routinely in cutaneous tests. The suspensions from which antibody was prepared were made from streptococci preserved in the dense suspensions in the glycerol-NaCl solutions menstruum.

Studies on the *in vitro* production and nature of artificial antibody from NaCl solution suspensions of streptococci by the application of prolonged heat in the autoclave and much less heat after adding oxidizing agents such as H_2O_2 or O_2 under 2000 lbs. pressure have shown that the organisms disintegrate, the remnants became sharply agglutinated, toxic components diminished or disappeared, and substances resembling specific antibodies appeared in solution. Hence the bacteria-free supernatant of the heated suspensions will be designated as thermal or artificial antibody.

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*Grateful acknowledgment is hereby made for the cooperation of superintendents of hospitals, directors of Boards of Health, attending and resident physicians, and pathologists and nurses which made this study possible.

*From the Bacteriologic Research Laboratory, Longview Hospital, Cincinnati, Ohio.

The neutralizing action of artificial antibody on poliomyelitic virus, virulent for mice, was studied by the methods usually employed. Four parts of centrifugated 5 per cent emulsions of the spinal cord and brain of mice that had succumbed to poliomyelitis were mixed respectively with 1 part of undiluted antibody, freshly perpared with H_2O_2 and heat, and as a control with 1 part of NaCl solution. The mixtures were incubated at 37° C. for 1½ hours, kept in the refrigerator over night, and 0.03 ml. inoculated intracerebrally under ether anesthesia far forward in the right frontal lobe. Three highly virulent virus strains were used: I am indebted to Dr. Charles Armstrong, of the National Institute of Health, Washington, D. C., for the strain of virus he adapted to the mouse and to Dr. C. W. Jungeblut of New York City for two murine strains isolated by him.

After it was found that parallel reactions were obtained on intradermal injection of natural antibody consisting of 10 per cent solutions of the euglobulin fraction of the serum of horses that had been immunized with the streptococcus and artificial antibody and that late reactions due to sensitization did not occur following injection of the latter, artificial antibody was used routinely for the detection of specific streptococcal antigen in skin or blood. Approximately 0.03 ml. was injected intradermally as superficially as possible about 4 cm. apart, usually over the volar aspect of the forearm. A sharply blanched bleb 5 mm. in diameter was taken to indicate that the right layer and the right amount was injected. An immediate erythematous reaction at the site of intradermal injection of antibody was taken as indicating the presence of antigen in the skin or blood immunologically related to the antigen or streptococcus from which the injected antibody was prepared, resembling the Foshay phenomenon discovered in tularemia.[5] Antibody prepared from streptococci isolated from nasopharynx of well persons, of persons ill with diseases other than poliomyelitis remote from epidemic poliomyelitis, and NaCl solution containing 0.2 per cent phenol were injected as controls.

A similar immediate erythematous reaction occurred if uncombined antibody was present in skin or blood following intradermal injection of solutions of specific polysaccharide or streptococcal antigen in the bacteria-free supernatant of NaCl solution suspensions containing 10 billion streptococci per ml. after heating at 65° or 70° C. for one hour. This reaction was taken to indicate antibody in skin or blood specifically related to the streptococcus from which the injected antigen was prepared, resembling the Francis test for pneumococcal antibody in pneumonia.[6] Of the two materials containing antigen, that in the supernatant of the heated suspensions proved the more satisfactory and hence was used routinely for detecting specific antibody in skin or blood. The maximal erythema following injection of antibody and antigen was outlined with pen and ink and the size in square centimeters was determined and recorded by superimposing circles of predetermined size on a transparent card 10 x 15 cm. in size.

The agglutinative titer of natural antibody in the serum from immunized horses and artificial antibody was determined at five-fold dilutions of 1-20 to 1-2500, and that of serum of persons before and after subcutaneous therapeutic injections of artificial antibody was determined at five-fold dilutions of 1-10 to 1-1250. The dilutions of artificial antibody and serums and of suspensions of streptococci were made in NaCl solution containing 0.2 per cent phenol. Two-tenths ml. of the dilutions of antibody or serum and 0.2 ml. of the suspensions containing approximately 5 to 6 billion streptococci per ml. were added to test tubes 3 x ⅜ inches. The mixtures were thoroughly shaken and incubated at 48° to 50° C. for 18 hours. Readings were made under the edge of the shade of a 100-watt light bulb against a nonreflecting black velvet background. The degree of agglutination for the four dilutions was recorded according to the usual scale of 0 to 4 plus. In order to make comparisons readily possible and to avoid needless repetition of figures in tables and charts, the total possible agglutination for the four dilutions was determined in percent. Thus, a 4+ agglutination for each of the four dilutions would be 16/16 or 100 per cent. If the total observed agglutination was 7+, the percent of the total possible would be 7/16 or 44 per cent, and so forth.

Results of Cultures of Precipitation Tests and of Inoculation of the Streptococcus in Mice

Cultures from the NaCl solution washings of nasopharyngeal swabbing on blood agar uniformly revealed large numbers of colonies of greening or alpha streptococci from all of 37 persons suffering from poliomyelitis in 30 contacts and 32 non-contacts. Usually no—or only occasionally a few—hemolytic colonies of streptococci and relatively few colonies of micrococcus catarrhalis and staphylococci grew.

Short chained streptococci of the viridans type of morphology were always found in greatly predominating numbers in the first tube of the serial dilution cultures in dextrose brain broth and nearly always in pure culture at the endpoint of growth. Platings of the growth at the endpoint always yielded green producing or alpha streptococci and almost always in pure culture. In these, hemolytic streptococci were not obtained.

Cultures and precipitation tests were made according to the methods previously described from nine samplings of outdoor air.[7] Five of these were made in the general region where poliomyelitis occurred but not in epidemic proportions and four in the heart of the epidemic in Minneapolis and St. Paul, Minnesota, and surrounding environs. The average distance driven for the five samplings was 198 miles, for the four samplings 75 miles, a total of 1290 miles. Streptococci were isolated from the endpoint of growth of serial dilution cultures in dextrose brain broth that had been inoculated with centrifuged sediment of the NaCl solution washing of the

Table 1. Incidence of flaccid paralysis in mice following intracerebral inoculation of streptococci isolated in studies of epidemic poliomyelitis, 1946.

Streptococci isolated from:		Strains	Mice					Brains of mice	
			Inoculated intracerebrally	In which: Paralysis developed		In which: Spasms occurred	That died	Cultured	Yielding the Streptococcus.
				No.	%				
Nasopharynx of persons suffering from acute poliomyelitis in:	Cincinnati, Ohio On isolation	12	44	$\boxed{36}$	$\boxed{82}$	3	26	9	7
	Chicago, Illinois on isolation	11	20	$\boxed{17}$	$\boxed{85}$	1	20	20	20
	On isolation	2	18	$\boxed{13}$	$\boxed{72}$	2	5	4	3
	After seven subcultures		18	2	11	0	1	1	1
Poliomyelitic virus, adapted to the mouse.		4	53	$\boxed{30}$	$\boxed{58}$	4	36	25	21
Nasopharynx of	contacts	12	22	$\boxed{16}$	$\boxed{72}$	6	20	20	14
	non-contacts	3	6	$\boxed{3}$	$\boxed{50}$	0	6	6	3
Outdoor air in epidemic zone		3	31	$\boxed{23}$	$\boxed{77}$	1	28	20	19
Nasopharynx of persons suffering from epilepsy		34	181	5	3	$\boxed{143}$	148	108	100
Nasopharynx of well persons remote from poliomyelitis and epilepsy		46	62	2	3	7	26	17	13

(The squares in this and the following tables are used to indicate specificity.)

exposed bronze turnings in seven of the nine samplings, and streptococci grew in dextrose brain broth into which was planted the exposed bronze turnings in two of the five and in all of the four samplings. Each of the four strains of streptococci isolated from the four samplings made in the heart of the epidemic and two of the five strains isolated remote from the epidemic were agglutinated specifically by artificial antibody and immune horse serum prepared from streptococci isolated in studies of poliomyelitis and by convalescent serum. Cultures made after the samplings had been kept at room temperature for one month yielded essentially the same results, while cultures made 10 months later proved free from streptococci.

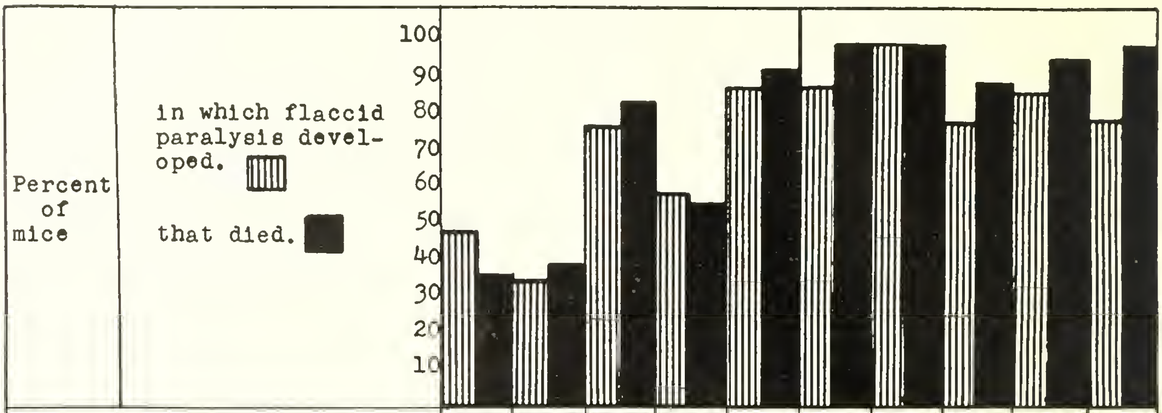
Interface precipitation tests made with the NaCl solution washing of the exposed bronze turnings and the "poliomyelitis" antistreptococcal horse serum were positive for each of the four samplings made in the heart of the epidemic and negative for the five samplings made remote from the epidemic. Precipitation tests made with the pooled serums of persons in whom reactions indicating antibody were low were negative for all samplings. While with the pooled serums of persons whose reactions indicating antibody were very high following therapeutic intramuscular injection of artificial antibody, precipitation at the interface was positive for three of the four samplings made in the heart of the epidemic and negative in the rest.

The marked tendency of streptococci, freshly isolated in studies of poliomyelitis, to produce flaccid paralysis in monkeys, rabbits, and guinea pigs on appropriate inoculation has been reported.[1] The effect of intracerebral inoculation into mice of strains freshly isolated from persons ill, from contacts and non-contacts, from poliomyelitic virus virulent for mice, and from outdoor air in the epidemic zone, was studied and is summarized in Table 1. Paralysis, usually flaccid in type, developed in high incidence in the mice receiving streptococci freshly isolated from nasopharynx of persons suffering from poliomyelitis, from the "virus" virulent for mice, from contacts and non-contacts, and from outdoor air in the epidemic zone. Thus, of a total of 47 strains inoculated into 194 mice, paralysis developed in 138 or 71 per cent and spasms were seen to have occurred in only 17 or 9 per cent. After cultivation of two of the strains on the usual type of mediums for only a short time, the incidence of paralysis dropped from 72 per cent to 11 per cent.

Thirty-four strains of streptococci isolated in studies of epilepsy were inoculated in like manner into 181 mice (Table 1). In only 5 or 3 per cent did paralysis develop, and convulsive seizures developed in 143 or 79 per cent. Paralysis developed in only 2 mice or 3 per cent and spasms were seen to have occurred in 7 or 11 per cent of the 62 mice inoculated with 46 strains of streptococci isolated from the nasopharynx of well persons remote from poliomyelitis.

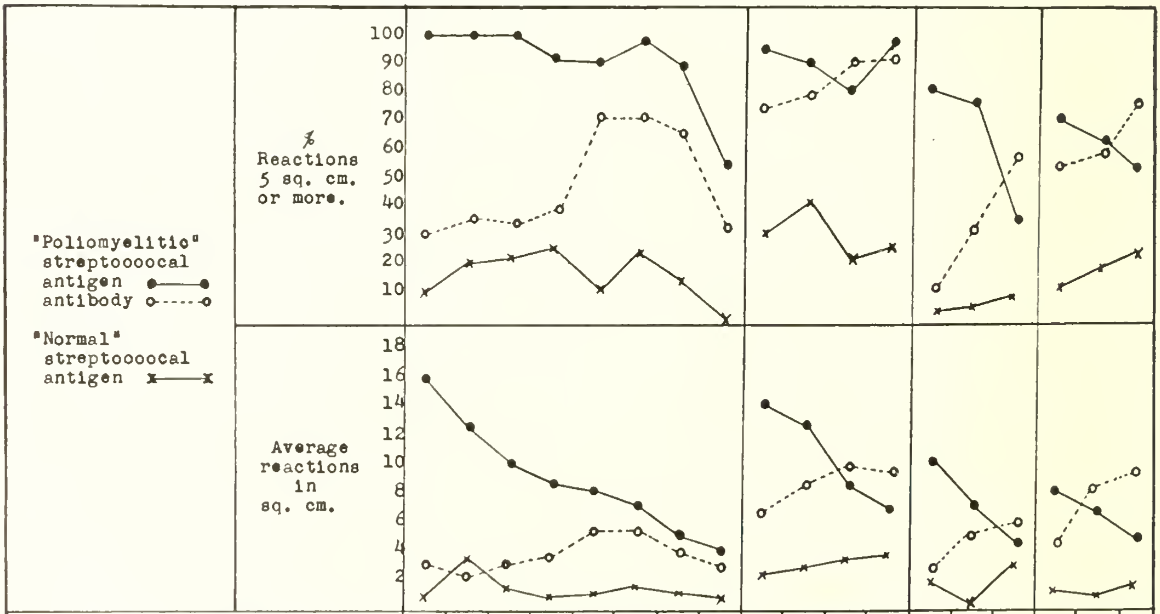
In accord with previous studies, pleomorphic diplococci sometimes in short chains were found after special staining in or at the periphery of the lesions in the

Figure 1. Neutralization of virus virulent for mice by artificial antibody prepared from streptococci isolated in studies of epidemic poliomyelitis and experimental (virus) poliomyelitis in monkeys.



Mice inoculated	39	17	40	96	14	37	13	35	85	10
Experiments	7	3	4	14	1	7	3	4	14	1
Average time of death, days	6.3	5.4	5.0	5.6	2.4	3.4	3.8	3.7	3.6	2.8
Animal passage of virus	2nd and 3rd	4th	5th and 6th	Total	6th	2nd and 3rd	4th	5th and 6th	Total	6th
Virus treated with	Antibody				Antigen	Isotonic NaCl solution.				
	Poliomyelitic streptococcal									

Figure 2. Erythematous reactions to intradermal injection of "poliomyelitic" and "normal" streptococcal antibody, indicating antigen and "poliomyelitic" streptococcal antigen, indicating antibody in skin or blood of persons suffering from epidemic poliomyelitis and of well contacts during the epidemic in 1946 in relation to the incidence of poliomyelitis in 1945.



Duration of disease or contact, days.		1-5	6-10	11-15	16-25	26-30	31-40	41-50	51-60	1-5	6-10	11-15	16-25	5-27	28-42	43-77	5-27	28-42	43-56
Persons tested		36	31	63	53	14	28	16	9	23	26	15	7	55	80	142	14	24	14
Incidence of Poliomyelitis	1946	High								Low				High			Low		
	1945	Low								High				Low			High		
Groups		Acute epidemic poliomyelitis												Well contacts					

spinal cord in each of six persons who had died of acute poliomyelitis.

Neutralization of Virus by Artificial Antibody

Since the streptococcus isolated from the brain and spinal cord of mice that succumbed to poliomyelitis following inoculation of virus was agglutinated specifically by artificial antibody prepared *in vitro* and natural antibody prepared in horses with the streptococcus isolated in studies of epidemic poliomyelitis and by convalescent human serum, and since it produced paralysis in mice in high incidence, the action on virus, virulent for mice, of artificial antibody was studied.

Three solutions of artificial antibody were used. All were freshly prepared, two from streptococci isolated in studies of epidemic poliomyelitis, one in previous epidemics and the other in the epidemic of 1946, and one from the streptococcus isolated from natural poliomyelitic virus that had been passed successively through monkeys for many years, the Flexner MV strain.

The neutralizing action of solutions of artificial antibody in 14 different experiments on a large number of mice was comparable for the three solutions and is summarized in Figure 1. It will be seen (1) that the incidence of flaccid paralysis and of deaths was far less and the average duration of life significantly longer after inoculation of virus that had been treated with antibody after the second or third animal passage than following control inoculations of virus that had been treated in NaCl solution; (2) that the neutralizing action of antibody became progressively less after additional passages of the virus through mice, and that the supernatant of NaCl solution suspensions, or antigen, corresponding to suspensions from which antibody was prepared had no neutralizing action. The somewhat irregular results in neutralization experiments with artificial antibody in these experiments were similar to those on the neutralization of virus virulent for monkeys with convalescent serum reported by others.[8]

Results of Cutaneous Tests for Specific Streptococcal Antigen and Antibody

In Figure 2 are depicted graphically the results obtained following intradermal injection of "poliomyelitic" and "normal" streptococcal antibody and "poliomyelitic" streptococcal antigen in altogether 250 persons suffering from poliomyelitis, in 277 well contacts in regions where the incidence of poliomyelitis was low in 1945 and moderately or very high in 1946; in 71 persons suffering from comparatively mild attacks of poliomyelitis and in 52 well contacts in regions where the incidence was high in 1945 and low in 1946. It will be seen (1) that the average size of the reaction in square centimeters and the reactions 5 sq. cm. or more to intradermal injection of antibody, indicating antigen, was highest at the onset of the disease in regions where the incidence of poliomyelitis was low in 1945 and high in 1946 and next highest in regions where the incidence was high in 1945 and low in 1946, and that the reactions became gradually less with time as recovery ensued, far more slowly in the former than in the latter group; (2) that reactions indicating antigen in well contacts soon after exposure, while lower than in persons stricken, was highest in regions where the incidence of the disease was low in 1945 and high in 1946 and that reactions indicating antigen diminishes with prolonged contact; and (3) that reactions to control antibody prepared from streptococci isolated from the nasopharynx of well persons remote from poliomyelitis were uniformly low and had little or no relation to the disease nor to contact.

Reactions to intradermal injection of antigen indicating specific streptococcal antibody, were lowest early in the course of the disease and soon after contact, far lower in regions where the incidence of poliomyelitis was low in 1945 and high in 1946 than in regions where the incidence was high in 1945 and low in 1946, and increased more slowly in the former than the latter groups with recovery or with prolonged contact. Since the cutaneous reactions indicating streptococcal antigen were highest at the onset of poliomyelitis and gradually diminished as recovery ensued, and since the reactions indicating antibody were low at the onset of the disease and increased as recovery occurred, the reactions to antibody and antigen were summarized according to age in persons suffering from poliomyelitis.

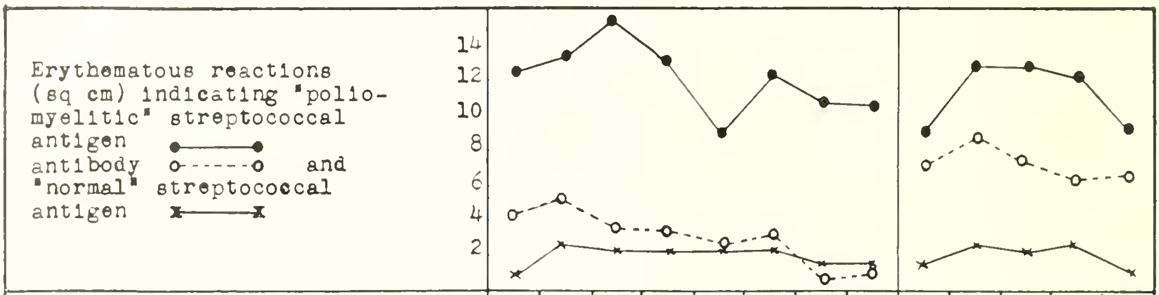
A summary of such reactions are depicted graphically in Figure 3. It will be seen that the reactions indicating streptococcal antigen were highest in age groups most susceptible to poliomyelitis, both in regions where epidemic poliomyelitis had and had not occurred in 1945.

Reactions indicating antibody were far lower throughout the different age groups where poliomyelitis had not occurred or occurred in low incidence in 1945 and in high incidence in 1946 than where the incidence of poliomyelitis was high in 1945 and low in 1946. Moreover, in both regions antibody was highest in the very age groups where mortality to poliomyelitis is low, and diminished with increasing age, corresponding roughly to the increase in mortality rate according to age. The reactions to "normal" streptococcal antibody were minimal and bore no relation to age.

As shown in Figure 4, the cutaneous reactions indicating streptococcal antigen in skin or blood in well noncontact persons within epidemics and at the outskirts of epidemics paralleled roughly susceptibility to poliomyelitis according to age. Well persons who resided in Rockford, Illinois, during the epidemic in 1945 and the slight recurrence in 1946 showed less antigen and much more antibody in skin or blood than well persons who resided in regions where the incidence of poliomyelitis was low in 1945 and high in 1946.

The results of cutaneous tests made on well non-contact and on non-contact patients in hospitals within and remote from epidemics of poliomyelitis are summarized in Table 2. It will be seen that reactions in square centimeters and percent of reactions 5 sq. cm. or more, indicating specific streptococcal antigen in skin or blood, were greatest in well non-contact persons residing in re-

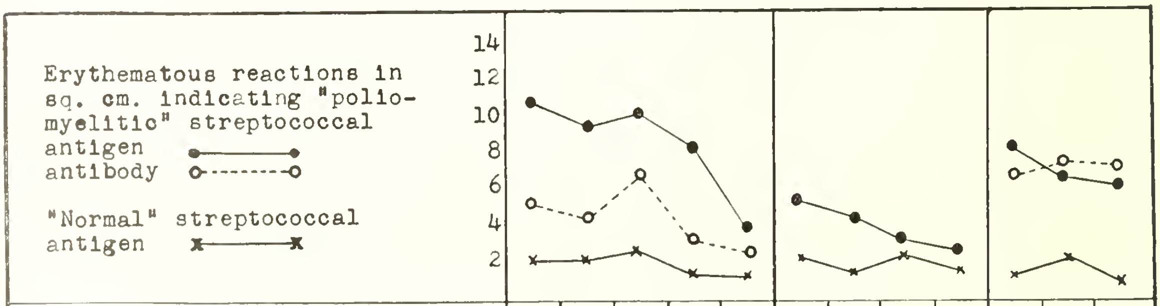
Figure 3. Erythematous reactions to intradermal injection of "poliomyelitic" and "normal" streptococcal antibody indicating antigen and "poliomyelitic" streptococcal antigen indicating antibody in skin or blood of persons suffering from epidemic poliomyelitis according to age in relation to the incidence of poliomyelitis in 1946 and 1945.



Age groups by years.		1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	1-5	6-10	11-15	16-20	21-25
Duration of disease in days.		11	11	13	15	15	10	14	11	23	10	17	14	19
Persons tested 234 52		29	68	48	37	18	18	10	6	4	19	17	6	6
Incidence of poliomyelitis	1945	Low								High				
	1946	High								Low				

gions where the incidence of the disease was low in 1945 and high in 1946, lower in regions where the incidence was high in 1945 and low in 1946, still lower in regions where the incidence was low both in 1945 and 1946, and least in regions far remote from poliomyelitis. Reactions to the control antibody prepared from streptococci isolated from the nasopharynx of well persons remote from poliomyelitis were consistently minimal or negative. Reactions indicating specific streptococcal antibody in skin or blood were relatively low in regions where the incidence was low in 1945 and high in 1946 and by far higher in regions where the incidence was high in 1945 and low in 1946. Antibody and antigen were low where the incidence of poliomyelitis was low both in 1945 and 1946 and least in well persons far remote from poliomyelitis. Cutaneous reactions indicating antigen and antibody were far less in non-contact patients cared for in hospitals for non-infective ailments than in well non-

Figure 4. Erythematous reactions indicating "poliomyelitic" streptococcal antigen and antibody in skin or blood of well non-contact persons according to age who resided within or at the outskirts of the epidemic of 1946 and well non-contacts who resided in Rockford, Ill. during the severe epidemic of 1945 and the slight recurrence in 1946.



Age groups, years		3-15	16-25	26-35	35-45	46-65	3-15	16-25	36-55	56-82	3-15	16-25	26-45
Persons tested		16	17	21	16	21	19	11	10	17	21	17	23
Relation to epidemics	1945	Low					Outskirts of				High		
	1946	High					epidemic 1946				Low		

Table 2. Erythematous reactions to intradermal injection of "poliomyelitic" and "normal" streptococcal antibody indicating antigen and "poliomyelitic" streptococcal antigen indicating antibody in skin or blood of well non-contact persons in 1946 in relation to the incidence of poliomyelitis in 1945.

Incidence of poliomyelitis		Number of		Erythematous reactions (sq. cm.) to intradermal injection of					
		Groups	Persons	"Poliomyelitic" streptococcal				"Normal" streptococcal antibody indicating antigen.	
				Antibody indicating Antigen		Antigen indicating Antibody			
1945	1946	Tested		Sq cm.	% 5 sq cm or more.	Sq cm.	% 5 sq cm or more.	Sq cm.	% 5 sq cm or more.
Low	High	5	225	$\boxed{8.1}$	$\boxed{80}$	3.4	32	1.5	12
		3	50*	3.84	14	1.36	4	1.2	0
High	Low	6	210	6.6	68	$\boxed{6.7}$	$\boxed{79}$	1.6	19
Low	Low	2	147	4.1	30	1.8	7.5	1.1	9
Far remote from poliomyelitis		2	127	1.2	7	0.5	1.5	0.8	4
		2	54*	1.76	0	0.75	0	0.87	0

* Non-contact bed patients in hospitals having illness other than poliomyelitis.

contacts in regions where the incidence of poliomyelitis was low in 1945 and high in 1946 and reactions in similar hospitalized patients after the epidemic had disappeared were minimal and comparable to well non-contacts (Table 2).

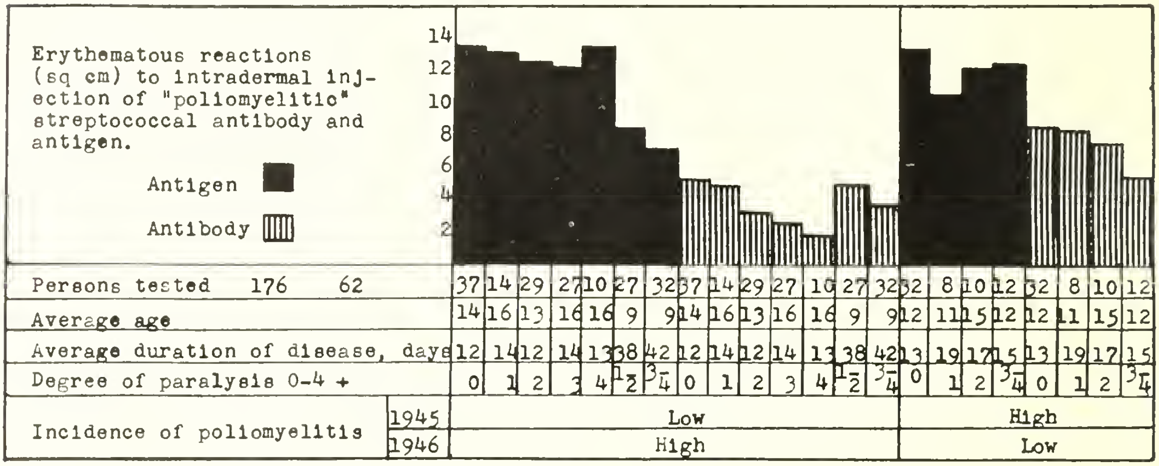
In accord with the isolation of the "poliomyelitic" type of streptococcus from outdoor air during the epidemic, it was found that reactions indicating antigen in two otherwise comparable groups of patients were twice as great in the group cared for in an "outer" ward of a general hospital in which windows were widely open, some facing hospital wards where cases of poliomyelitis were cared for, than in the group in an "inner" ward more shielded from outdoor air.

Similarly, in the epidemic zone the average reaction indicating antigen was 6.82 sq. cm. and the reaction indicating antibody was 2.69 sq. cm. in 66 nurses living in nurses' home, and 9.07 sq. cm. and 4.69 sq. cm. respectively in 62 nurses doing comparable work in hospitals and living in private homes at some distance from the hospital.

The reactions indicating antigen in skin or blood of persons who had had poliomyelitis long before residing in the epidemic zone were slightly less, and reactions indicating antibody were slightly greater than in similar groups that had not had poliomyelitis.

Cutaneous tests were made with altogether nine different solutions of artificial antibody and of corresponding antigen prepared from streptococci isolated in studies of poliomyelitis, with three control solutions of antibody prepared from streptococci isolated from the nasopharynx of well persons remote from poliomyelitis, and with five control solutions of antibody prepared respectively from streptococci isolated from the nasopharynx of persons suffering from acute respiratory infection, chronic encephalitis, arthritis, epilepsy, or schizophrenia, all remote from poliomyelitis. Three of the nine solutions of antibody and antigen prepared from streptococci isolated in studies of poliomyelitis were prepared from streptococci isolated from the nasopharynx, and two from the spinal fluid and spinal cord of persons who suffered from or who succumbed to epidemic poliomyeli-

Figure 5. Erythematous reactions in persons suffering from poliomyelitis 1946 to intradermal injection of "poliomyelitic" streptococcal antibody, indicating antigen and antigen indicating antibody in skin or blood according to the degree of paralysis and to the incidence of poliomyelitis in 1945.



Persons tested 176 62	37	14	29	27	10	27	32	37	14	29	27	10	27	32	32	8	10	12	32	8	10	12
Average age	14	16	13	16	16	9	9	14	16	13	16	16	9	9	12	11	15	12	12	11	15	12
Average duration of disease, days	12	14	12	14	13	38	42	12	14	12	14	13	38	42	13	19	17	15	13	19	17	15
Degree of paralysis 0-4 +	0	1	2	3	4	1-2	3-4	0	1	2	3	4	1-2	3-4	0	1	2	3-4	0	1	2	3-4
Incidence of poliomyelitis 1945	Low														High							
Incidence of poliomyelitis 1946	High														Low							

tis. Two were prepared from streptococci isolated from spinal fluid or brain and spinal cord of monkeys that were ill with or that had succumbed to poliomyelitis following inoculation of passage virus; one was prepared from streptococci isolated from the brain and spinal cord of mice that died of poliomyelitis following inoculation of virus virulent for mice and one was prepared from three strains of the streptococcus isolated from outdoor air in the epidemic zone. Reactions to antibody prepared from streptococci isolated in studies of epidemic and experimental poliomyelitis and from outdoor air in the epidemic zone were roughly comparable and were uniformly far greater than reactions to intradermal injection of the different control antibody solutions. Reactions to control injections of NaCl solution, containing 0.2 per cent phenol made in 157 persons suffering from poliomyelitis, contacts and non-contacts were uniformly minimal or entirely negative.

Some months after these tests were made, my attention was called to the work of Jensen[9] who found that the titer of poliomyelitic viral neutralizing antibodies of convalescent serum was by far lower in paralytic than in non-paralytic or abortive cases. The reactions indicating antigen and antibody in skin or blood of the large number of patients tested were summarized according to the presence or not of paralysis, to the degree of paralysis and to the incidence of poliomyelitis in 1945 and 1946. The data are summarized graphically in Figure 5. Reactions indicating specific streptococcal antigen in skin or blood were high, quite regardless as to whether paralysis was absent, slight or marked, and the average reactions were slightly greater in regions where the incidence of poliomyelitis was low in 1945 and high in 1946. In sharp contrast, the reactions indicating specific streptococcal antibody were far less in the group that contracted poliomyelitis in 1946 where the incidence of poliomyelitis had been low in 1945, as compared with the small group that contracted poliomyelitis in 1946 where the incidence had been high in 1945. In both groups, especially in the former, the average reactions indicating antibody were greatest in persons with little or no paralysis and least in persons severely paralyzed, corresponding to the viral titers reported by Jensen.

RESULTS OF CUTANEOUS AND AGGLUTINATION TESTS

In Table 3 is shown the parallelism between reactions to intradermal injection of antigen indicating antibody and the agglutinative titer for streptococci isolated in studies of epidemic and experimental poliomyelitis and from outdoor air during the epidemic in 1946 of the serum of persons suffering from poliomyelitis and of well persons who lived in Rockford, Illinois, during the severe epidemic of 1945 and the slight recurrence in 1946. The comparative lack of antibody in skin or blood and in the serum of the five persons who resided in regions where poliomyelitis had not occurred in 1945 is noteworthy. The relatively low agglutinative titer of the serum from persons whose cutaneous reactions indicating antibody was low, and the high agglutinative titer of the serum from persons whose reaction indicating antibody was high for strains isolated in studies of epidemic and experimental poliomyelitis and outdoor air and the lack of agglutinins for the control strains are all strikingly shown.

The agglutinative titers of artificial antibody prepared from streptococci isolated in studies of epidemic and experimental poliomyelitis and as controls of antibody prepared from streptococci isolated in studies of schizophrenia, epilepsy, and well persons over the respective streptococci are summarized in Table 4. A high degree of specificity of artificial antibody was shown for the homologous types of streptococci isolated in studies respectively of poliomyelitis including strains isolated from "virus" poliomyelitis in monkeys and mice and in

Table 3. Erythematous reaction to intradermal injection of "poliomyelitic" streptococcal antigen, indicating antibody in skin or blood, in relation to the agglutinative titer of the serum of persons suffering from poliomyelitis and of well persons who lived in Rockford, Illinois during the epidemic of 1945 and the slight recurrence in 1946.

Groups studied in Rockford, Illinois.	Persons and serums.	Cutaneous reaction in sq. cm. indicating in skin or blood "poliomyelitic" streptococcal.		Percentage of total possible agglutination by serum of persons suffering from poliomyelitis and of well persons at five fold dilutions of 1-10 to 1250 of streptococci isolated from:					
				Nasopharynx, spinal fluid and spinal cord of persons who succumbed to poliomyelitis	Nasopharynx of persons suffering from poliomyelitis after one mouse passage	Virus of poliomyelitis virulent for monkeys.	Outdoor air during the epidemic of poliomyelitis, 1946	Nasopharynx of persons suffering from arthritis.	Nasopharynx of well persons remote from poliomyelitis.
		Antigen	Antibody	(20)*	(14)	(7)	(3)	(15)	(18)
Persons having Poliomyelitis.	2	17.77	2.14	9	25	6	3	0	0
	2	12.57	9.62	29	50	35	25	3	6
	2	14.23	12.57	38	41	35	19	3	7
Well persons.	5**	4.28	2.32	2	10	1	6	2	4
	5	6.87	10.96	34	42	28	32	4	0
	5	7.66	10.91	37	41	36	27	3	0
	3	8.04	10.35	40	42	36	38	6	0

*Numbers in parenthesis indicate strains of streptococci in respective suspensions.
**Persons living in Rockford in 1946 but who resided in regions in 1945 where poliomyelitis did not occur.

Table 4. Agglutinative titer of artificial antibody prepared from streptococci isolated in studies of epidemic and experimental poliomyelitis.

Source of streptococci subjected to agglutinative action of artificial antibody.			Strains or pools	Percentage of total possible agglutination of streptococci at five fold dilutions (1:20 to 2500) of antibody prepared from streptococci** isolated in studies of:					
				Poliomyelitis			Schizophrenia	Epilepsy	Well persons
				Epidemic		Virus			
				5990 (20)	2243 (14)	5386 (1)	789 (7)	1079 (1)	1076 (11)
Persons suffering from epidemic poliomyelitis	Nasopharynx, spinal fluid, brain & spinal cord prior to 1946		5990 (20)*	44	75	44	13	6	0
	Nasopharynx during the epidemic of 1946		2243 (14)	75	81	63	31	25	25
Outdoor air during epidemic of 1946			1902 (3)	31	50	38	0	0	0
Spinal fluid, brain & spinal cord of monkeys	that succumbed to "virus" poliomyelitis.		6960 (7)	69	75	75	31	25	25
			5386 (1)	75	75	81	25	25	25
Brain & spinal cord of mice,			2004 (3)	63	75	56	19	0	19
Nasopharynx of persons remote from poliomyelitis	suffering from	Arthritis	8762 (8)	25	25	25	31	25	31
		Schizophrenia	789 (7)	19	19	19	50	25	19
		Epilepsy	1079 (1)	0	6	13	6	56	6
	in normal health	Medical students	1117 (14)	31	31	25	31	31	63
		Children	1076 (11)	0	6	0	6	6	44

*The figures in () indicate number of strains.
**The antibody solutions as used in these experiments consisted of the bacteria free supernatant of 1:100 dilutions of isotonic NaCl solution of the dense 1000 billion streptococci per ml suspensions in glycerol two parts and saturated NaCl solution one part.

Table 5. Agglutination of streptococci isolated in studies of poliomyelitis by the serum of persons suffering from acute poliomyelitis before and 24 hours after therapeutic injection of "poliomyelitic" streptococcal antibody.

Source of serums		Serums before & after therapeutic injection of antibody	Percentage of total possible agglutination by the serum of persons at 5 fold dilutions of 1-10 to 1-1250 of streptococci isolated in studies of:								
			Epidemic poliomyelitis					"Virus" poliomyelitis			Arthritis
			Cases		Contacts	Non-contacts	Outdoor air	Monkeys		mice	
			5990* (20)	1893 (14)	(4)	(2)	1902 (3)	6960 (7)	5386 (1)	2004 (3)	8912 (15)
Persons suffering from acute epidemic poliomyelitis	2058 (10)**	Before	19	31	11	0	13	19	25	19	0
		24 hours after	$\boxed{44}$	$\boxed{56}$	$\boxed{24}$	3	$\boxed{32}$	$\boxed{38}$	$\boxed{38}$	$\boxed{38}$	0
	2059 (7)	Before	13	25	11	11	16	0	38	19	0
		24 hours after	$\boxed{38}$	$\boxed{44}$	$\boxed{29}$	16	$\boxed{31}$	$\boxed{25}$	$\boxed{50}$	$\boxed{31}$	0
	2060 (6)	Before	13	25	11	16	14	19	16	19	0
		24 hours after	$\boxed{25}$	$\boxed{56}$	$\boxed{29}$	$\boxed{31}$	$\boxed{33}$	$\boxed{31}$	$\boxed{31}$	$\boxed{38}$	0
	2061 (12)	Before	19	13	16	11	17	38	31	25	0
		24 hours after	$\boxed{25}$	$\boxed{50}$	$\boxed{33}$	11	$\boxed{29}$	$\boxed{50}$	38	$\boxed{38}$	0
	2062 (5)	Before	6	31	13	6	11	13	13	13	0
		24 hours after	$\boxed{38}$	$\boxed{50}$	$\boxed{27}$	$\boxed{13}$	$\boxed{29}$	$\boxed{38}$	$\boxed{25}$	$\boxed{25}$	0
Well persons remote from poliomyelitis.		(18)***	0	25	6	11	0	0	0	0	0
		(5)	6	25	9	14	6	6	6	0	6
Persons suffering from:	Idiopathic epilepsy	(30)	0	25	6	11	0	0	0	0	0
	Schizophrenia	(14)	0	25	5	11	5	0	0	0	0

*Figures within parentheses indicate the number of strains of streptococci pooled; **day of disease; and *** number of serums per pool.

studies of schizophrenia, epilepsy and well persons.

The serum of horses that had been immunized with the streptococcus isolated in studies of poliomyelitis also agglutinated the streptococcus specifically.

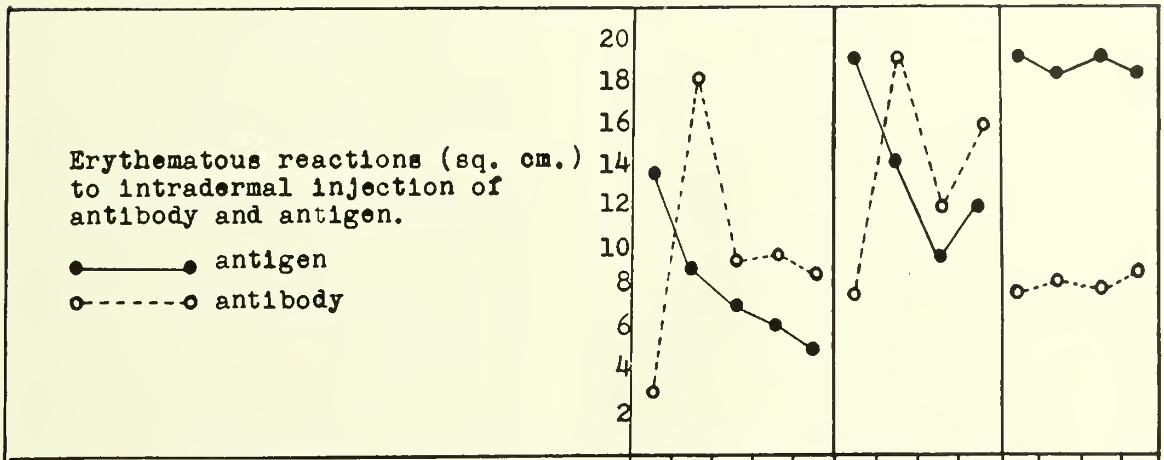
The agglutinative titers for streptococci of the serum of persons suffering from poliomyelitis before and 24 hours after therapeutic injection of artificial "poliomyelitic" streptococcal antibody are summarized in Table 5. A consistent increase in titer was found in these serums 24 hours after therapeutic injections of artificial antibody for streptococci isolated in studies of epidemic poliomyelitis, of contacts and non-contacts, of outdoor air, and of experimental "virus" poliomyelitis in monkeys and mice, and which was not found for streptococci isolated in studies of arthritis.

RESULTS OF THERAPEUTIC INJECTION OF ARTIFICIAL ANTIBODY

A summary of the effects of therapeutic injection of artificial antibody on cutaneous reactions indicating antigen and antibody respectively is shown graphically in Figure 6. Only one therapeutic, intramuscular, or subcutaneous injection of artificial antibody was given to each patient. This usually consisted of 2 ml. of the solution of antibody from 5 billion streptococci for children five years of age or younger and two additional milliliter for each additional year of age up to 20 years. A truly remarkable diminution of antigen and increase in antibody uniformly occurred in from one to three hours after the injection and remained at low and high level respectively for 24 or 48 hours or longer. Control injection of NaCl solution had no apparent effect.

Of the 26 patients each receiving one therapeutic injection of the "poliomyelitic" streptococcal antibody, 19 showed clinical improvement, apparently attributable to this new treatment, as cutaneous reactions indicating antigen promptly diminished, and reactions indicating antibody increased. In two of these, both advanced cases of bulbar poliomyelitis, the improvement was temporary and death from respiratory failure ultimately occurred. In no instance of the 26 patients given therapeutic injection were the symptoms made worse. No clinical change attributable to the injection of antibody occurred in seven; all were severely paralyzed and four of the seven died. All of the four who died had been in the respirator because of advanced bulbar poliomyelitis and beneficial action was not to be expected. The details of

Figure 6. Erythematous reactions to intradermal injection of antibody and antigen indicating antigen and antibody respectively in skin or blood of persons suffering from poliomyelitis following therapeutic intramuscular injection of "poliomyelitic" streptococcal antibody.



Time of cutaneous tests, before B, and hours after therapeutic injection of antibody or of NaCl solution.	B	3	12	24	48	B	3	12	24	B	3	12	24
Duration of disease, average	4.7 days					8.9 days				9.5 days			
Persons tested, average age, years	15			13		11		13		4		12	
Cutaneous tests (92)	16	2	5	10	6	12	5	6	7	4	3	1	3
Therapeutic intramuscular injections	Antibody									NaCl solution.			

the results obtained in treatment will be reported elsewhere.

Comments and Summary

The results of a bacteriologic and epidemiologic study of poliomyelitis made by new methods are reported.

The presence in the epidemic of poliomyelitis of 1946 of a specific type of streptococcic infection was indicated (1) by the consistent isolation from persons stricken, of streptococci that produced flaccid paralysis associated with degeneration of anterior horn cells in high incidence in mice; (2) by the specific agglutinative titer of convalescent serum, the serum of horses that had been immunized with the streptococci isolated in previous epidemics and the artificial antibody prepared from the streptococcus isolated in previous and the current epidemic; (3) by the erythematous reactions to intradermal injection of natural and artificial antibody and to antigen prepared from the streptococcus isolated in previous and the current epidemic indicating, respectively, specific streptococcal antigen and antibody in skin or blood; (4) by the progressive diminution of antigen and the increase in antibody in skin or blood and by the increase of the agglutinin titer in the serum as spontaneous recovery occurred; (5) by the abrupt drop in antigen and abrupt increase in antibody in skin or blood of persons suffering from poliomyelitis and the improvement in symptoms following therapeutic injection of the "poliomyelitic" streptococcal antibody and by its neutralizing action of poliomyelitic virus virulent for mice; and (6) by the demonstration of pleomorphic diplococci in the lesions in the spinal cord of persons who succumbed to poliomyelitis and their absence remote from the lesions.

The epidemiologic importance of the streptococcus was indicated (1) by the demonstration of specific streptococcal precipitinogen in and the isolation from outdoor air within the epidemic zone of a streptococcus which produced flaccid paralysis in mice in high incidence and which was agglutinated specifically in high titer by artificial antibody prepared from streptococci isolated from persons suffering from poliomyelitis and by convalescent serum; (2) by the isolation of the streptococcus true to type from the nasopharynx of well contacts and noncontacts in the epidemic zone; (3) by the general presence of this type of subclinical streptococcal infection in contacts and non-contacts as indicated by cutaneous tests; and (4) by the decrease in antigen and increase in antibody in skin or blood on prolonged contact; and (5) by the absence of this type of streptococcus in the air and in persons remote from poliomyelitis.

The production in mice of the all-important symptom, flaccid paralysis, associated with edema, hemorrhage and degeneration of ganglion cells in the anterior horns of the spinal cord with the streptococcus isolated from persons ill, well contacts and outdoor air is considered of fundamental importance even though some of the clinical and histological findings as seen in epidemic poliomyelitis in humans and experimental "virus" poliomyelitis in monkeys were lacking.

The reactions indicating a far higher streptococcal antibody content of skin or blood and in the serum of well non-contact persons in regions where poliomyelitis was epidemic in 1945 than in regions where the incidence of poliomyelitis was low in 1945 parallel the increase in viral neutralizing antibodies in the serum of well persons [10] after exposure [11] and after epidemics reported by others.[12,13,14]

The high titer of specific streptococcal antibody in skin or blood during convalescence from poliomyelitis and in well persons during mild outbreaks in 1946 where poliomyelitis was epidemic in 1945 reported herewith indicates it would seem the etiologic role of the streptococcus for the same fundamental reason that the presence of viral neutralizing antibodies in the serum of convalescents and well persons in relation to the occurrence of epidemics reported by others indicates the etiologic role of the virus.[8,15,16,17]

Moreover, the greatly lower titer of streptococcal antibody in skin or blood reported herewith and the greatly lower titer of viral neutralizing antibodies reported by Jensen [9] in convalescent serum of paralytic poliomyelitis than in abortive or non-paralytic poliomyelitis likewise indicate etiologic significance of both the streptococcus and virus and that perhaps paralysis developed because of the lack of adequate antibody formation. Whether this striking parallel lack of viral and streptococcal antibody formation in paralytic poliomyelitis is expressive of a familial, physiologic or autarceologic defect and hence heightened susceptibility, as suggested by Aycock [18] and as emphasized by Anderson,[19] or whether due to a particularly severe infection by the streptococcus or virus is not clear.

Cutaneous reactions obtained in epidemic poliomyelitis before and after therapeutic injection of artificial antibody were similar to those obtained in studies of influenza and other epidemic respiratory infections, and in arthritis, epilepsy and schizophrenia with antibodies prepared from streptococci isolated from persons suffering from these respective diseases. Interestingly, intradermal injections elicited reactions indicating specific streptococcal antigen for six to eight weeks following attacks of poliomyelitis and for only two to three weeks following attacks of epidemic respiratory infections, corresponding to the enduring immunity in poliomyelitis and the transient immunity in influenza and epidemic respiratory infections.

The much higher specific antibody titer in well persons and in persons stricken in regions where poliomyelitis was epidemic in 1945 and where few cases occurred in 1946, than that of well persons and persons stricken in regions where few or no cases occurred in 1945 and where poliomyelitis was epidemic in 1946, the general presence of the specific type of streptococcus in both regions in 1946 and the absence of specific antigen and antibody in persons far remote from poliomyelitis indicate that the immunity to poliomyelitis following epidemics may be due to a greatly accelerated response in antibody formation on antigenic restimulation by the "seasonal" recurrence of the specific type of streptococcus and perhaps the accompanying virus.

The question whether the abrupt decrease in specific antigen and increase in antibody following therapeutic injection of artificial antibody is due wholly to the antibody injected, as would seem, or whether due in part to the release of preformed sessile antibodies from lymphocytes, reticulo-endothelial and other cells remains undetermined. This question, the further effects of therapeutic injections and the chemistry of artificial antibody are under study.

The data adduced in this study by the use of the new methods are in accord with previous studies and indicate anew that a specific type of alpha streptococcus, in some way, is etiologic in epidemic poliomyelitis. Experiments indicating the nature of the apparent relationship of both the streptococcus and the virus to poliomyelitis are not lacking. By the use of special methods the streptococcus has been consistently isolated from or demonstrated in the spinal fluid at the onset of symptoms of epidemic and experimental poliomyelitis when polymorphonuclear leukocytes are the predominating cell in the spinal fluid and in the lesions in the spinal cord,[20] in the lesions after death, and in filtrates and emulsions of poliomyelitic virus.[1] Filtrable transmissible poliomyelitic virus resembling natural virus in infectivity and antigenicity has been produced experimentally from "neurotropic" streptococci, including strains isolated from material wholly remote from poliomyelitis.[1,21,22,23]

The studies on the virus made now for nearly 40 years have been so alluring that the solution of the problem has quite naturally been sought from this standpoint, almost to the exclusion of forthright bacteriologic studies. It is hoped that the results, reported herewith, will lead to a broader approach at the solution of this problem than that hitherto employed, to a study of both the streptococcus and the virus.

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Book Reviews

An Introduction to Personal Hygiene, by LAURENCE B. CHENOWETH, M.D., Director of Student Health, University of Cincinnati. New York: F. S. Crofts & Co., 1947. 345 pp.

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This book is an excellent text for a one semester introductory course in the study of hygiene for college students. It is the result of many years of experience as director of student health services and teacher of college hygiene on the part of the author.

It contains careful selection of that material most interesting and helpful to the college student. The amount of material included in each division is carefully balanced and the development of the subject matter of each unit has a historical approach. This elicits the interest of the students and gives a knowledge of the development of the science.

At the close of each chapter is found an excellent list of questions for review and discussion, and a very complete bibliography of references for further study.

The cell as a unit of structure development of the human body is approached through a study of the psychology of reproduction. The text then proceeds to discuss the more important hygienic facts of most interest and most value to the college student. One chapter is devoted to Cancer, and another chapter to Heredity. Six chapters are devoted to Nutrition and one chapter each to Alcohol, Endocrine Glands, Infections, Mental Abnormalities and Mental Hygiene. The last chapter is devoted to a general consideration of specific measures in the prevention of disease. The text contains eighty well-chosen graphs and illustrations. A. O. DeW.

Treatment in General Practice, by HARRY BECKMAN, M.D. Philadelphia: W. B. Saunders Co., 1948. Sixth edition, 1129 pages. $11.50.

Because this book is kept so thoroughly up to date (the last edition was in 1945), and because it covers every logical demand made in a general practice, it has become a standard reference in modern medical literature.

The new edition (the sixth) seems to be a worthy follower of its predecessors. Thirty-three entirely new discussions have been added and over 100 additional have been rewritten and revised. Some of the new and revised material includes data on psychogenic rheumatism, Rickettsialpox, 11 new uses in streptomycin administration, the Rh factor, epilepsy, and management of penicillin reactions.

The general practitioner unfamiliar with Beckman's book will find it highly valuable as a quick and thorough reference; physicians who have used it in the past (and their number must be enormous) will find the new edition substantiates the publisher's statement that this is a thorough presentation of the world's latest and best treatments. J. N.

The Treatment of Bronchial Asthma, by VINCENT J. DERBES, M.D., and HUGO TRISTRAM ENGELHARDT, M.D., F.A.C.P., with chapters by a panel of contributors. Philadelphia: J. B. Lippincott Co., 1946. 445 pages, 61 illustrations. $8.00.

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In the 445 pages of this book will be found a complete discussion of bronchial asthma by the two authors and their 17 collaborators. The etiology, physiology, pathology and immunology of this common disorder are all thoroughly covered. Classification, symptomatology and differential diagnosis are clearly presented.

There are interesting chapters on medical history as it pertains to asthma, on statistics of bronchial asthma and on predisposing and contributing factors, including climatic and weather effects, and psychogenic factors.

Practical methods of specific testing are outlined. The occurrence and importance of the various inhalant and ingestant allergens are discussed adequately.

Specific allergic treatment is presented in a clear and detailed manner, although many allergists would question some of the dosage schedules proposed.

Non-specific treatment (including surgery) is covered fully except that the newer antihistaminic and antispasmodic drugs are not included.

There is a chapter on complications of asthma and finally a discussion of "cardiac asthma."

Most of the 23 chapters of this book are well written, easily read, thorough and authoritative. References are arranged at the end of each chapter.

This book should prove to be valuable to any practitioner who is called upon to care for patients suffering from this widespread affliction. D. W. C.

Causes of Error in Proctologic Diagnosis and Treatment

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Error in the diagnosis and treatment of rectal and colon affections is perhaps greater than in any other field of medical practice. It is my hope to call attention to some of the most frequent causes for this situation.

The first is the too casual consideration of proctologic conditions. By this I mean an inadequate history, a cursory examination (if any), an operation done without careful consideration of all factors involved, and little or no after care. As a result, 20 per cent of our patients have had previous unsatisfactory operative procedures, and innumerable ones come to us with incorrect diagnosis and advice as to what should be done for their relief. A carefully taken history is extremely important. This is particularly true since colon and rectal disease have many symptoms in common, and not infrequently there may be lesions present in both organs. To accept a patient's statement that he has hemorrhoids or some other relatively simple rectal condition, and to operate upon him without careful consideration as to whether or not there may be some coexisting colon condition is to invite disaster. Seeing patients who have been operated for hemorrhoids but who also have a rectal or colon cancer is so frequent as to be commonplace. We also not infrequently see patients with ulcerative colitis or proctitis who have been recently operated for hemorrhoids—without examination—because they had told their physician that they had "bleeding piles."

I think physicians are particularly negligent in obtaining an adequate history as to abdominal symptoms in cases where the patient complains of rectal disease. This is particularly true where the patient has hemorrhoids or some other obvious abnormality. Regardless of rectal findings, a careful history relative to colon symptoms should be taken. This should include the chronic or intermittent passage of diarrheal stool, the passage of blood or mucus, the presence of recurrent or persistent abdominal cramp; whether the cramps are productive or unproductive; the presence of persistent or recurrent areas of abdominal tenderness, the presence of abdominal mass, and whether or not there is an elevation of temperature.

Since the passage of blood and mucus is perhaps the most common symptom noted by the patient in colon and rectal diseases, greater attention should be paid to this symptom. There is a general impression that dark blood with clots indicates a lesion in the colon and bright blood the rectum. This may be true in the majority of cases but exceptions to this rule are so numerous that the "rule" has no value. In fact, this idea has done a great deal of harm, since many physicians have been led to make a diagnosis as to the location of the lesion on the type of blood. The important fact is that blood of any kind has been passed. The location of the lesion can only be determined by further careful investigation. Proctoscopic examination is valuable in determining whether or not blood is from the rectum or colon. If there is no evidence of a bleeding lesion in the rectum, but blood or blood and mucus can be seen on a normal bowel wall above the rectum, it may be reasonably assumed to be coming from a lesion in the colon beyond proctoscopic vision.

Recurrent unproductive abdominal cramps not infrequently indicate a progressive constricting lesion. The usual history is of increasing frequency and severity as the obstruction becomes more complete. Cramp followed by diarrheal stools more often indicate an inflammatory or functional condition. Localization of the cramp in one situation is more suggestive of constriction though such localization is frequent in the sigmoid region due to diverticulae, an irritable elongated sigmoid, or in women, lesion of the generative organs. Elevation of temperature is more likely in inflammatory conditions, which may be separate or as a complication of malignant change.

Once a colon lesion is suspected, the chief cause of error lies in poorly done X-ray examination. I say poorly done X-ray examination because in this day and age if a colon lesion is suspected, an X-ray examination is almost always done. However, the fact that colon X-ray study is a tricky procedure is not appreciated by many physicians. Gross lesions are usually quite easily demonstrated but small lesions are often very difficult. I say usually because within the past few months a competent roentgenologist missed a carcinoma in the distal third of the transverse colon which was so far advanced that three weeks later complete obstruction developed. Inadequate examination is worse than none, since it causes the physician to have a false sense of security.

It is my conviction that before a negative diagnosis is made in colon cases, an examination should be done by a well-trained roentgenologist. It should not be done by a technician or a physician who does only casual X-ray work. The bowel should be thoroughly cleaned out with 2 ounces of castor oil. A barium-tannic acid enema should be given, with a thorough fluoroscopic examination and a careful manipulation of the bowel. This should be followed by plates before and after evacuation of the enema and finally following the inflation of the colon with air. In case of a gross lesion, the latter steps of procedure may be unnecessary. Pieces of stool can give the appearance of small tumors. In this event,

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unless there is deformity of the bowel wall or a definite attachment to the bowel wall by a pedicle can be demonstrated, the examination should be repeated, including the castor oil preparation. If the lesion can be demonstrated in the same location in the colon on two successive examinations, it may be assumed to be an organic change. In cases where injection of the barium reveals a high grade obstruction, complete filling of the colon should not be done. If the barium is forced by the narrowed area, the patient is often unable to expel it, and the surgeon is compelled to operate upon a colon distended with a mass of hardened barium. If no obstruction is present, careful examination of the entire colon should be done, since not too infrequently multiple lesions may be present.

In cases where X-ray examination is negative but blood can be seen coming from beyond the proctoscope, we advise repetition of the examination every three months for one year unless a lesion is demonstrated earlier. Occasionally a growth too small to be demonstrated by one examination will increase in size enough to be shown at subsequent examinations.

It has been my experience that lack of X-ray investigation is more often due to the physician than resistance of the patient. Most patients are cancer conscious, and I find the majority not only willing but anxious to have X-ray studies, once the situation is presented to them.

While X-ray examinations are invaluable in colon lesions, they are of little value in rectal lesions—and, in fact, are frequently the cause of error. I have never been able to determine why physicians order X-ray studies on an organ so easily felt and visualized. The findings are usually misleading rather than helpful. In the case of large lesions which the X-ray will show, presence of a mass is obvious; and small lesions do not show on X-ray. Thus a negative report lulls the physician and patient into a false security. Always use X-ray freely in suspected colon lesions and never use it in suspected rectal lesions.

History in the case of rectal lesions is interesting and may lead to the suspicion of the presence of some lesion not apparent on examination. Digital examination reveals the presence of masses, tender areas, etc. The only error likely to occur from digital examination is the palpation of a hard piece of stool, the cervix uteri, or an extra rectal mass which is thought to be a rectal tumor. Inspection of the rectum through the proctoscope quickly reveals the true situation.

Error is not infrequently made in a biopsy of a rectal mass. In most instances where biopsy is indicated it should be done in the hospital and often under anesthesia. Simply snipping away a small piece of protruding material is inadvisable. Only too often this is simply a ragged inflamed fragment of normal mucosa. A good sized piece or pieces should be removed from the most suspicious portions of the mass and the area carefully fulgurated. Even this may not be conclusive, as both benign and malignant areas may be found in the same tumor.

Assuming diagnosis to be correct, lack of good operative results in rectal conditions most often occur due to (1) lack of knowledge of the anatomy of the rectal and anal region, and (2) poor postoperative care. There is a marked individual variation in the anatomy of the rectal and anal regions. Most operations about the rectum and anus are plastic in character and unless these anatomical differences are known and taken into consideration, the best results cannot be obtained. To the casual observer, all sheep look alike, but to the expert sheep herder, each has a different appearance and possesses a different personality. I am afraid that most physicians come in the casual observer class insofar as rectum and anus are concerned. Attributing a personality to an anus and rectum may perhaps be somewhat far-fetched, but I can assure you that these anatomical variations exist and are important. Briefly stated, these differences as they apply to the surgery of this region are as follows: (1) Variations in the length of the anal canal (½ to 3 inches); (2) The amount and placement of the musculature around the anal canal and lower rectum; (3) The diameter of the anal canal both at rest and with maximum dilation; (4) The position of the dentate line—that is, the point of juncture of the squamous and columnar epithelium; (5) The texture of the skin, anodern, rectal mucosa and other tissues making up these organs. Lack of consideration of these factors often leads to poor results.

Good rectal surgery should achieve three results: (1) The relief of any pathological condition present; (2) Restoration of a normally functioning rectum and anus; (3) The dismissal of the patient in such condition that further rectal trouble is improbable. In view of the present trends in beach and evening wear, we might add the desirability of a good cosmetic result.

In the case of the usual rectal conditions with the exception of fistula, perhaps the most frequent unsatisfactory result is that of anal stenosis. As a result, the patietn has difficulty with bowel movement, and constipated stools produce cracks or abrasions in the anoderm which are painful and often bleed. This may occur because the anal canal was inadequate in size before operation and the condition was not corrected, or that constriction results from inflammation or the removal of too much tissue. Many individuals do have congenitally small anal outlets. In these cases it is not sufficient to leave the opening the size it was before operation—its diameter must be increased.

In the case of anal fissure there is usually a degree of anal stenosis, either congenital or acquired. It is lack of consideration of this factor which so often causes imperfect results in treatment of anal fissure. If no stenosis is present, anal fissure or cracks often yield to medical treatment. If stenosis is present, it is best to tell the patient at once that only surgery will give permanent relief.

In many instances some other rectal abnormality is present as well as the fissure, and these should be eradicated if the operation for fissure is to be successful. A small fibrous polyp exists at the upper pole of many fissures and in most cases a so-called sentinel pile is present at the caudal end of the fissure. These must be removed to secure a cure. Occasionally some varicosed hemorrhoidal vessel may underly the fissure. This condition is essentially a varicose ulcer and the underlying hemorrhoid must be removed if the fissure is to heal. Finally the anal canal must be enlarged until it is adequate in size and a normal stool can be passed without cracking the anoderm.

I am sure that the most common cause of failure to cure the fistula is the fact that the internal or primary opening into the rectum is not discovered at the time of operation. There seems to be a general impression that "blind" fistula with no internal opening is a frequent occurrence. As a matter of fact, such a condition is very uncommon. Many fistulous tracts do not extend directly into the bowel but somewhere along their course turn at a more or less acute angle to enter the rectum. Because of this angulation the passage of a probe into the bowel from the external opening may not be possible. However, if the probe is inserted as far as possible and the tract incised this far, it is often quite easy to turn the probe to the proper direction and pass it into the rectum. If a probe cannot be passed through from the external opening, inspection and probing of the crypts of Morgagni may reveal the internal opening. The majority of fistulas originate here and the offending crypt is usually easily discoverable. Relying upon dye to demonstrate the tract often leads to error. Because of areas of constriction or tortuosity of the channel or plugs of mucus, dye cannot be injected through many fistulous tracts even though the fistula is a complete one. I have not used dye for many years but depend upon following the tract by the use of proper probes. There may also be lateral tracts extending from the primary one. The presence of indurated tissue adjacent to the primary tract suggests their presence and careful searching with probes after curetting the tract base will usually reveal their location.

Recurrence and/or difficulty in healing is not infrequently due to the surgeon leaving the wrong kind of wound. Deep narrow incisions tend to bridge over, forming pockets. The edges of such an incision should be trimmed back, leaving a broad flat saucerized wound with no overhanging margins. This wound is easy to dress and does not tend to bridge over. Fistula is the result of infection and may be caused by infection other than a single infection of one crypt of Morgagni. Fistula is a common complication of colitis, proctitis, lymphopathia venerea and other diffuse inflammatory conditions. It also occurs as a complication of rectal stricture due to malignancy or other causes. Before operation for fistula it is wise to determine if any such conditions are present, for operation upon such fistulas are often unsatisfactory or at least healing may be prolonged.

Assuming the fistula has been operated in such a manner that proper healing does occur, there is the question of bowel control. This has to do with the extent of the fistula and the anatomical construction of this particular patient. There are quite wide variations and these must be considered.

In general there are two groups of sphincter muscles: the external sphincter which is a separate and distinct muscle, and an internal group of muscles often referred to as the internal sphincter. Since this is not a separate and distinct muscle, I think it is better referred to as the internal sphincteric ring. It is this internal sphincteric ring which has the chief control of bowel continence. Since most fistulas originate in the crypts of Morgagni, the majority seek exit below the internal sphincteric ring, and hence these muscles do not need to be divided. The external or social sphincter, or the bridge table sphincter as it is sometimes called, is purely a voluntary muscle. Its function is to complete the act of defecation in a clean manner and can be voluntarily contracted as an accessory precaution if there is undue pressure from stool or gas on the internal sphincter group. In other words, it often enables the patient to successfully make the next filling station. In some patients, even though the internal sphincter is not divided, some impairment of control of gas or soft stool may result. As has been stated, this group of muscles may be thin and weak, perhaps less than 1 cm. in diameter. These patients when deprived of the use of their accessory external sphincter may have trouble. On the other hand, the internal ring may be 2 or 3 cm. in diameter and these patients usually have no trouble even though the external sphincter is divided. In cases where the internal opening is above both sphincteric rings, both must be divided and anything up to complete incontinence must be expected. Fortunately, most sphincteric defects can be repaired either at the time the fistula is operated upon or by subsequent operation. If any degree of incontinence is anticipated, the patient should by all means be told before operation is done.

In considering failure in the treatment of hemorrhoids, both injection and surgical treatment should be included. There are several causes for failure or unsatisfactory results in the injection method. First and foremost, I believe it is injecting cases not suitable for this method, and the second, insufficient number of injections. Complete and permanent cure can be attained only in the case of internal hemorrhoids and there are some limitations in this group. These hemorrhoids should not be inflamed, fibrosed or accompanied by a large amount of redundant mucosa. A contracted anus may prevent the passage of an anoscope so that injection is not possible. The sphincteric ring should not be too relaxed so that the hemorrhoids will not remain inside the rectum after injection. Complications of slough with or without embarrassing infection and/or hemorrhage are usually due to the injection of too much or too strong solution, injections made too close to the surface, or the injection of a hemorrhoid while still indurated from a previous injection. In reality but few people have uncomplicated internal hemorrhoids. Most often anal or external hemorrhoids coexist and often other abnormalities are also present. More often than not, complete and permanent relief can be secured only through surgery. Injection has its place in the treatment of hemorrhoids both for cure and palliation, but its use should not be advanced as the proper treatment in all cases.

Failure in the surgical treatment of hemorrhoids may result from several causes. Again anatomical conditions must be considered. Persons with a short anal canal tend to prolapse their hemorrhoids more readily than others. Likewise there is a greater tendency to eversion of the rectal mucosa. In operation on these persons it is necessary to remove three or four strips of rectal mucosa above the hemorrhoidal area. In many cases it is a redundancy which causes the prolapse more than the hemorrhoids. Failure to excise this redundant mucosa leads to later protrusion, which the patient interprets as recurrence of hemorrhoids. Difficulty results from the removal of too little or too much tissue—more often the latter. Obviously, if not sufficient hemorrhoidal tissue is removed, recurrence is inevitable. On the other hand, too much tissue removal results in an anal stenosis, causing difficulty with bowel movement, cracking, pain and bleeding. As in the case of fissure, not infrequently the anal canal is congenitally too small and, if so, this should be widened by incision at time of operation. Sufficient anoderm and mucosa over the internal hemorrhoid should be left to allow adequate dilation without cracking the anal canal. The surgeon should be able to insert two fingers through the canal at the completion of the operation. Postoperative care is important in all cases. Our patients are seen daily over a period of two weeks and then less often until healing is complete. The margins of the wounds are retracted and kept wide apart so bridging cannot occur. The epithelium is made to line these wounds rather than let the wounds bridge across. I feel that more often lack of postoperative care rather than poor surgery produces unsatisfactory results. After healing has occurred, dilation is of little value.

Summary

In colon cases, I believe the greatest mistake lies in poor history taking, and in not carefully following up the story of disturbance of bowel habit, intestinal cramps, and the presence of bleeding. Too few X-ray examinations are made. I believe this is chiefly the fault of the physician. I have found most people are cancer conscious and if a few minutes are taken to explain the situation, the patient will welcome the suggestion that an X-ray study be done.

It is well agreed that the decrease in mortality in cases of cancer of the rectum and colon lies in the better preoperative preparation of our patients, the use of sulfas and antibiotics, and better postoperative care.

There is still a difference in opinion as to the type of surgery which is most efficient. I believe that the greatest mistake that can be made is to allow the patient to dictate the type of operation he is to have done. I refer particularly to whether or not the patient is to have a colostomy. All patients shrink from a colostomy, but if in the judgment of the surgeon this gives the patient the best chance of permanent cure, he should insist upon doing this type of operation. Assuming the lesion is not too far advanced, we divide our cases into three groups. If the growth lies at or above the peritoneal reflection, we prefer resection with primary anastomosis; if the growth lies entirely below the peritoneal reflection, but above the internal hemorrhoidal area, a Babcock-Bacon operation with preservation of the sphincters. In a few of these cases with the growth in the upper half of the rectum, anastomosis may be considered. If the growth is in the internal hemorrhoidal area or lower, abdominoperineal resection is definitely indicated. It is impossible to preserve the sphincter in these cases and a colostomy is preferable to a sphincterless anus. This division is an elastic one and the final decision must rest on many other factors, such as the size of the growth, the involvement of adjacent structures, degree of malignancy, the presence of metastases and the general condition of the patient.

In cancer of the transverse and left half of the colon, resection with primary anastomosis is usually the operation of choice. Exteriorization procedures in thin persons with redundant colons may allow adequate removal of bowel and mesentery. In fat persons with a short mesentery this is impossible. At best it is a multiple procedure where one would suffice. Cancer of the right half of the colon is best treated by removal of the right half of the colon and an anastomosis of the terminal ileum to the transverse colon. With the use of antibiotics, peritonitis seldom occurs.

Failure of the anastomosis, whether closed or open, is usually due to one of several causes. They are: (1) Lack of removal of fat from the bowel ends to be anastomosed, preventing accurate approximation of the bowel ends and producing a leaky anastomosis. (2) Inadequate blood supply, causing necrosis and secondary leakage. (3) Leakage from a poorly done anastomosis. (4) A non-patent or too tight anastomosis. In this case pressure due to gas or stool against the suture line may cause leakage either by tension or the production of necrosis.

Unfortunately, it is impossible in the short space of time allotted to me to enumerate all the mistakes which may occur in surgery of the rectum and colon, but I hope I have called attention to some of the more common errors which cause unfavorable results in proctologic surgery.

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Streptomycin in the Treatment of Various Tuberculous Conditions

A Report of Experience in Its Use in the Minneapolis Veterans Administration Hospital

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THE Minneapolis Veterans Administration Hospital has for the past fifteen months had the unusual opportunity of using streptomycin in the treatment of a wide variety of tuberculous conditions, and studying in detail the effects of such therapy. This opportunity arose from the institution within the Veterans Administration of a streptomycin investigative program, coordinated by a Committee on Streptomycin in the Central Office of the Veterans Administration in Washington, D. C. This Committee in June, 1946, instituted a pilot study program in five Veterans Administration Hospitals in coordination with similar programs in Army and Navy hospitals, and its early success warranted the expansion of the program to 21 Veterans Administration hospitals, designated as Streptomycin Study Units, in December, 1946. The Minneapolis Veterans Administration Hospital was one of the additional Study Units approved for the investigative program at this time, and thus has had a share in gaining much valuable information on various aspects of streptomycin therapy, and an opportunity to share this information with the medical profession of the Upper Northwest.

The scope of the streptomycin investigation, its limiting factors, and the criteria employed not only in selection of cases but in evaluating results, have been well outlined elsewhere.[1,2] The Study Units have not been free to treat any and all cases of tuberculosis under their care. Several considerations have wisely limited the selection of cases suitable for streptomycin therapy and the conditions of its administration. It is desirable to profit from the experience of other investigators, as to the kinds of conditions in which the antibiotic is effective, and as to the limitations of streptomycin therapy. It is necessary that a drug with as dangerous a toxic potential as streptomycin be given under conditions of strict laboratory and clinical control, until its toxicity as well as its effectiveness is clearly established. And, from the standpoint of uniformity of the Veterans Administration study as a whole, if the larger results of the 21 Study Units are to be meaningful, close agreement of the program in all is essential. Whereas obviously there have been many instances where there has been a temptation or a desire to employ streptomycin in cases falling outside the limits of the study, it has been the uniform impression of those participating that the limitations imposed have been wise, as well as fruitful.

Within the framework of the Veterans Administration streptomycin program, the Minneapolis Study Unit was set up in January, 1947, and began treatment of its first cases in February, 1947. As of March 31, 1948, the Minneapolis Study Unit had completed therapy on 112 cases and had in addition used streptomycin prophylactically for thoracic surgery in 28 cases. Brief explanations follow of the various types of tuberculosis treated, with reference to the criteria for selection of cases, the course of the disease during and after treatment, both with respect to symptoms and objective findings, and overall results. In the case of certain types of tuberculous conditions, longer discussion is included, intended to elaborate on and clarify certain special points.

PULMONARY TUBERCULOSIS

Streptomycin appears to be most effective on the more exudative forms of this disease. Admitting all the difficulties of being able to distinguish between exudative, productive, proliferative, and even fibroid tuberculosis by X-rays alone, the clinician is yet able, by assessing all clinical data (temperature record, sedimentation rate, hemogram, weight, etc.), to make a fairly accurate assessment of the acuteness of the pulmonary process[1]. In general, within the Veterans Administration program, only cases of predominantly exudative pulmonary tuberculosis have had streptomycin therapy directed toward their pulmonary lesions. But cases with other than exudative pulmonary lesions have received streptomycin for non-pulmonary tuberculosis, and have afforded an opportunity for studying the effects of the antibiotic on other than exudative lesions. The impression is uniform, that streptomycin exerts little favorable effect on this type of pulmonary lesion[1].

It is a frequent, almost universal, observation that on streptomycin therapy patients with pulmonary tuberculosis observe a reduction in cough and volume of sputum, which is averaging about 50 per cent. This reduction is maintained for a period of weeks or a few months, but then frequently there is a return to former levels. This reversal may not occur until the end of streptomycin therapy or later. Fever, if accompanying the condition, ordinarily is reduced, in many cases to normal. And the general sense of well-being which follows initiation of streptomycin therapy is a common occurrence. A reduction in bacterial content of the sputum is also frequently associated with initiation of therapy, and this may continue for weeks or a few months. Unfortunately, with the passage of time there is a considerable percentage of patients who undergo a reconversion of their sputum from a negative to a positive bacillary status.

From the Tuberculosis Service, Veterans Administration Hospital, Minneapolis, Minn.

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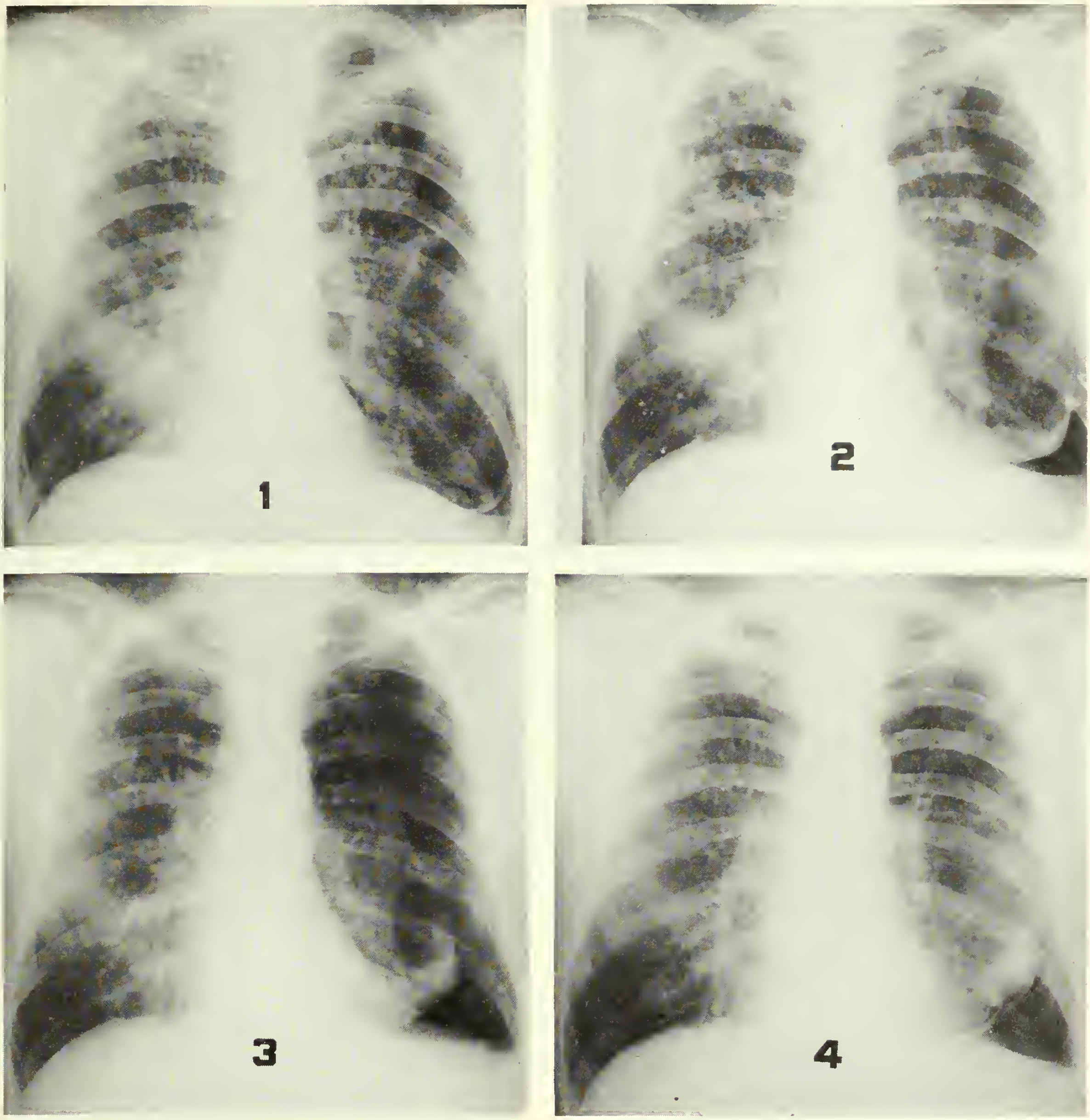

Fig. 1 (S. C.) This 41-year-old male had had pulmonary tuberculosis since February, 1946, and was hospitalized on October 19, 1946. On bed rest, there had been extension of the disease on the right, from an apical cavity, while a left pneumothorax was being maintained. Sputum was a Gaffky VI, sedimentation rate 35 mm./hr. (1) Film of 1-9-47, showing cavities in both apices, 3 mos. before streptomycin therapy. (2) 4-4-47, just prior to streptomycin therapy, showing extension of the disease in the right apical area (patient has had a bronchogram recently, with some iodized oil residuals). (3) 8-2-47, at end of 120 days of streptomycin therapy, showing marked clearing of lesions bilaterally, and reduction in size of cavities, although they are still visible. (4) 2-24-48, nearly 7 mos. after termination of streptomycin therapy, showing continued clearing. Patient left the hospital against advice soon after termination of streptomycin therapy. Sputum was negative during the last month of therapy, on smear and concentration, and has been negative for 5 mos. since leaving the hospital, including cultures.

Clearing of the more exudative lesions is commonly observed by X-ray, usually to its greatest extent in the second or early part of the third month of therapy.

Thus there is a considerable subjective improvement, and a fair degree of objective improvement, soon after streptomycin therapy is begun in cases of pulmonary tuberculosis of the exudative type. Were this status to continue, without complications, more optimism would be justified than is possible when faced with later developments in many cases.

As more of the cases treated earliest in the streptomycin program are followed for a longer period of time, it is seen that early reports of the effect of the antibiotic must be quite drastically modified. Ten cases of pul-

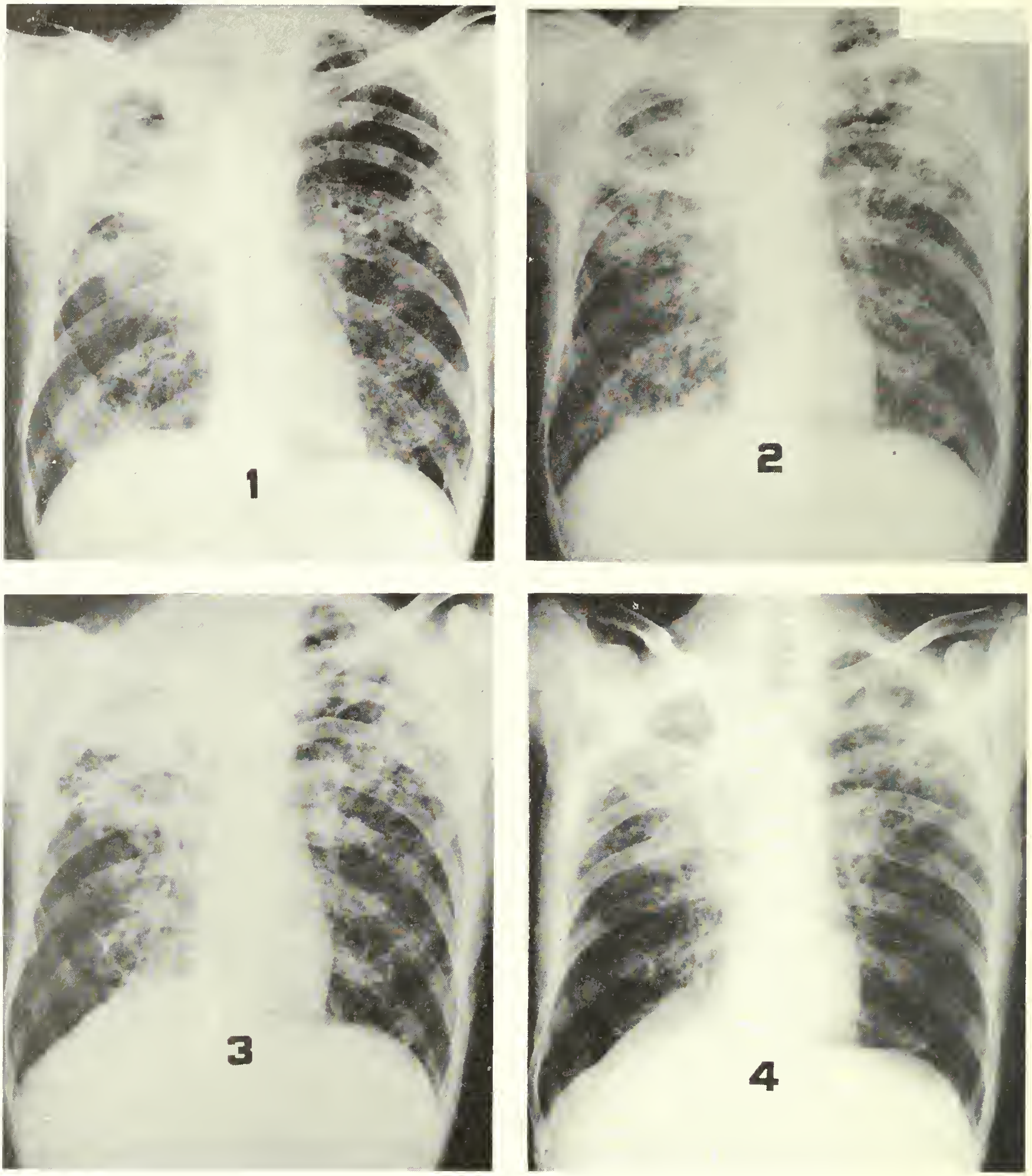

Fig. 2 (R. B.) This 42-year-old white male developed symptoms of his disease in August, 1946, and was hospitalized on November 14, 1946. Prior to streptomycin therapy his course was progressively downhill on bed rest, and sputum was Gaffky VI. (1) 11-16-46, approximately 3 mos. prior to streptomycin therapy, demonstrating large cavity in right apex with bronchogenic dissemination in both lungs. (2) 2-7-47, 3 days prior to start of streptomycin therapy, showing further progression of the disease, especially in the left upper lobe. (3) 6-10-47, the day of completion of 120 days of streptomycin therapy, demonstrating some clearing bilaterally. Sputum averaged Gaffky II. (4) 9-5-47, 3 mos. post-streptomycin, showing further clearing, but with residual excavation bilaterally. There had been some weight gain, but sputum had remained positive.

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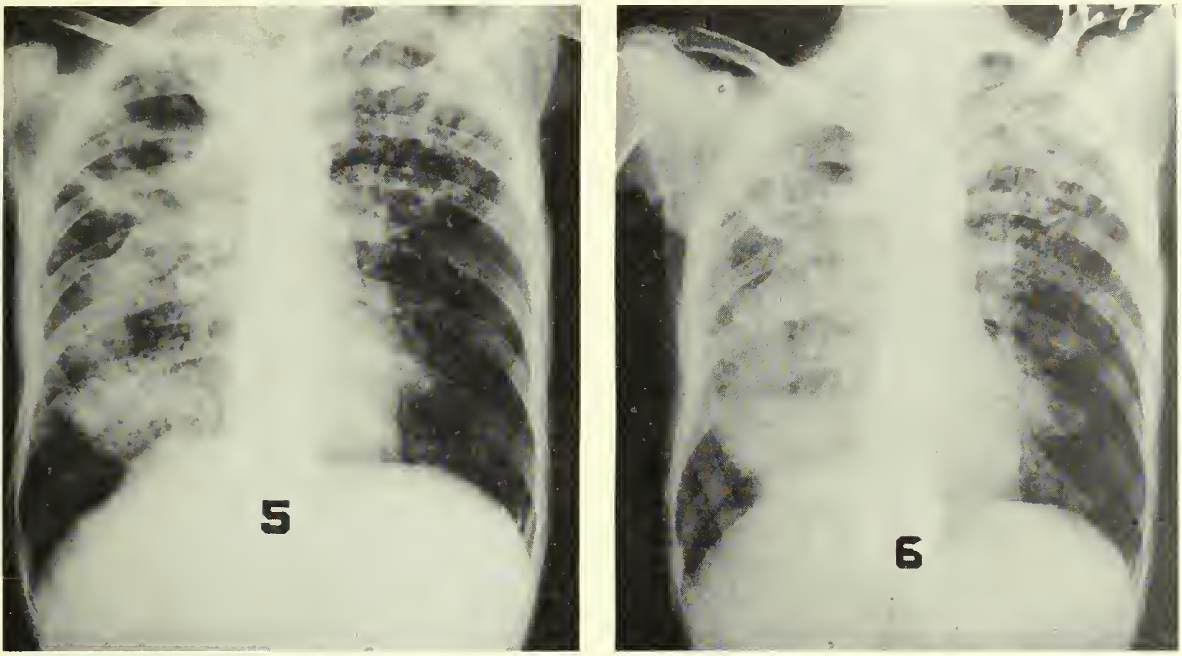

Fig. 2 (continued). (5) 10-16-47, 4 mos. post-streptomycin, showing severe extension of the disease. (6) 11-7-47, 5 mos. post-streptomycin. Course was steadily downhill, and patient died on 11-18-47, sputum Gaffky X. Development of resistance was undoubtedly a factor in the later course of this case.

monary tuberculosis were treated at the Minneapolis Veterans Administration Hospital, with 2 gms. a day, for 120 days, beginning in February to April, 1947, ending their therapy in June to August, 1947. Rating their status on the simple scale of improved (from an X-ray standpoint), unchanged, or worse, the following observations have been made at intervals (base line the beginning of therapy in each instance):

	Improved		Unchanged		Worse		Total No.
Time of Observation	No.	%	No.	%	No.	%	Cases
April, 1947 (1-2 mos. therapy)......	5	63	2	25	1	12	8
June, 1947 (3-4 mos. therapy)......	4	45	4	45	1	10	9
August, 1947 (1-2 mos post-therapy)..	4	40	3	30	3	30	10
October, 1947 (3-4 mos. post-therapy)..	4	40	1	10	5	50	10
January, 1948 (6-7 mos. post-therapy)..	3	30	1	10	6	60	10
April, 1948 (9-10 mos. post-therapy).	4	40	0	0	6	60	10

Two of the ten cases summarized in the preceding table are illustrated in figures 1 and 2. The two cases are illustrative of the ten cases treated as to type and extent of the disease before streptomycin therapy—extensive bilateral involvement, with a predominantly exudative component in at least one lung. The first case, figure 1, in spite of extensive disease, and leaving the hospital against advice soon after completion of streptomycin therapy, has done far better than expected. Cases similar to this have been included in the experience of most investigators. Presentation of results, however, should include such cases as figure 2 illustrates, where after an initial period of improvement there is rapidly progressive disease terminating in death. It seems very likely that the development of resistance to streptomycin on the part of the tubercle bacilli of this patient is correlated with this later course.

To demonstrate that Minneapolis' experience is not atypical in the Veterans Administration, a similar tabulation for three Study Units, characteristic of the larger experience in the study as a whole, is given[3]:

Time of Observation (Therapy begun from July, 1946, to February, 1947)	Improved No.	%	Unchanged No.	%	Worse No.	%	Total No. Cases
April, 1947	28	76	7	19	2	5	37
June, 1947	39	78	8	16	3	6	50
December, 1947	31	61	7	14	13	25	51
January, 1948 (7-13 mos. post-Rx).....	29	57	7	14	15	29	51

With respect to the percentage of cases treated with streptomycin rated initially as "improved," there is a reduction of one-third to one-half, as they are followed longer. The percentage of those originally classed as "worse" is increased five-fold in both groups, from the earliest to the latest report. This change is largely a reflection of relapses occurring during the latter part of and after streptomycin therapy. That the above figures are representative of the experience of most of the Study Units, a current report[3] reveals that of 141 cases treated in 14 Units, 69 (49 per cent) are classed as improved, 20 (14 per cent) as unchanged, and 52 (37 per cent) as worse at the end of a post-treatment observation period of 6-9 months.

Thus it is essential that favorable response to streptomycin early in the course of therapy, especially the subjective response, not be confused with the later less favorable course. It is nevertheless believed that the approximately 50 per cent of exudative lesions which appear to benefit, even after a fairly long period of follow-up, represent an improvement over results of other therapy available, unsupported by streptomycin.

TRACHEOBRONCHIAL AND LARYNGEAL TUBERCULOSIS

Whereas these conditions are usually associated with advanced pulmonary tuberculosis, and are to be regarded essentially as complications of the latter condition, they do present particular problems of therapy. The effect of streptomycin on tuberculous lesions of the mucosa of the larynx and tracheobronchial tree is striking: in the various Veterans Administration Study Units, approximately 85 per cent of 110 lesions are improved or healed, and only 15 per cent or less unchanged or worse[3]. The type of lesion which responds most rapidly and dramatically is an ulceration of the mucosa; such ulcerations heal completely with 30 to 60 days' therapy in a considerable majority of cases. Streptomycin is also effective, and only slightly less so than in ulcerative cases, in granulomatous lesions. Cases which are properly tuberculous (proved by biopsy), but exhibit neither ulceration nor granuloma but only general inflammatory changes, respond still less well, and there is serious question whether these should be subjected to streptomycin therapy at all. Dysphagia associated with severe tuberculous laryngitis is relieved promptly by streptomycin.

Because tuberculous tracheo-bronchitis is so intimately associated with pulmonary tuberculosis, overall results of therapy directed against lesions of the mucosa can be distinguished only with difficulty from the effect of the antibiotic on the pulmonary lesions. The same general observations made under pulmonary tuberculosis above apply here. One other point, however, is worth mentioning. Where tuberculous bronchial ulcerations are associated with tension cavities, the effect of streptomycin is not only on the bronchial lesion, but also on the cavities associated therewith: the cavity usually decreases considerably in size, and it is often possible to initiate other definitive therapy (as collapse therapy) where it was not possible to do so prior to streptomycin treatment. As time passes, however, such cavities often again increase in size.

TUBERCULOUS SINUSES AND FISTULAE

These conditions, often so troublesome in the past with therapeutic measures previously available, respond well to streptomycin therapy. The figures for over 500 lesions in the Veterans Administration Study Units are[4]: healed or improved, 90 to 95 per cent, unchanged or worse, 5 to 10 per cent. The rate of healing is prompt in most cases averaging eight weeks, and streptomycin may safely be discontinued soon after healing has occurred without danger of relapse. Most of the cases reported as "improved" are actually healed. Fistulae, communicating with body cavities (as the pleura, rectum, bladder, etc.), respond less well than sinuses draining bone or gland; and both fistulae and sinuses heal most rapidly when definitive therapy is instituted toward the condition underlying the fistula or sinus.

TUBERCULOSIS OF ALIMENTARY TRACT

Most of these lesions, presenting ulcerations of the mucosa, respond well to streptomycin therapy. Tuberculous lesions of the oropharynx—tongue, pharynx, tonsil—respond dramatically and promptly, with local symptoms improving in the first few days, with healing observable objectively beginning within a week or ten days, and with marked improvement or healing within 30 to 60 days. Intestinal lesions, as demonstrated by X-ray, respond equally dramatically, both from the standpoint of alleviation of symptoms and on X-ray observation, with greater and more prompt symptomatic improvement. Veterans Administration Study Unit figures on 70 cases of this type of tuberculosis[4] are: healed or improved, approximately 95 per cent, unchanged or worse, approximately 5 per cent.

TUBERCULOUS LYMPHADENITIS

This is another tuberculous condition which responds well to streptomycin therapy, especially the acute form of the disease (with local pain, heat, inflammation, and possibly fluctuation). Subacute or chronic forms appear to respond less well. Improvement is prompt, occurring within a few days to weeks, and healing, in the sense of subsidence of all symptoms and disappearance of the gland to palpation, is a common finding within 30 to 60 days of therapy. The relapse rate is low. Overall Veterans Administration figures on 34 cases are[4]: healed or improved, approximately 85 per cent, unchanged or worse, approximately 15 per cent.

TUBERCULOSIS OF BONE, JOINT, AND CARTILAGE

The final answer on the effect of streptomycin therapy in orthopedic tuberculosis is as yet by no means clear. There is fairly universally improvement of local symptoms, such as pain, limitation of motion, and local swelling; and such local complications as draining sinuses and abscesses are improved. Roentgenologic evidence of improvement on bone or joint lesions is more slow in making itself evident. The Study Units report the following[4] in 100 cases at the end of therapy: improvement (by X-ray), 35 per cent; no change, 60 per cent; and progression, 5 per cent. There is some suggestion that the full effect of streptomycin therapy may be much delayed, and that prolonged observation will be required before the results of therapy can be evaluated. For example, evaluation of 80 cases on an average of 4 months after terminating streptomycin therapy[4] indicates that 70 per cent are improved, 15 per cent unchanged, and 15 per cent worse. At present, there is a feeling among those best qualified to judge that streptomycin may best be used as an adjunct to standard orthopedic therapy, improving the results thereof, but much further study of this problem is needed.

GENITO-URINARY TUBERCULOSIS

This serious form of hematogenous tuberculosis, for which relatively little has been possible in the past other than radical surgery, has shown some promising response to streptomycin therapy, although it is certain that more time must pass before a final evaluation is possible. Prompt improvement of urinary symptoms is striking:

dysuria and frequency greatly improve within a few weeks, and bladder capacity increases. Lesions of the urinary bladder, observed cystoscopically, improve in a corresponding fashion. There is, however, little observable change on pyelography, either of the renal pelvis or ureters. The urine is sterilized in a considerable proportion of cases (approximately 80 per cent of 69 cases) but, as with sputum in pulmonary cases, there is a fairly large per cent of cases (17 per cent of 69) in which the urine reverts at a later date from negative to positive[4]. Where there is frank abscess formation in the renal pelvis, there is the worst prognosis from the standpoint of streptomycin therapy, but even in fairly advanced cases there have been some results considerably better than previously achieved without streptomycin. The Veterans Administration Study Unit figures are[3]: improved (objectively), 80 per cent; unchanged, 15 per cent; and worse, 5 per cent. Longer observation of cases so far treated, to determine late results, may be expected to reflect a less favorable result.

Miliary and Meningeal Tuberculosis

Whereas current Veterans Administration figures[3] indicate 45 per cent of these conditions improved, and 55 per cent worse—percentages less favorable than in many conditions discussed—these results are so much better than those of any form of therapy previous to the streptomycin era that they may be classed as phenomenal. Results are best in cases of miliary tuberculosis uncomplicated by meningitis, less good in tuberculous meningitis without miliary dissemination, and least good when both miliary and meningeal tuberculosis are present. The percentages of arrest or cure in the three categories are probably not greater than 50 per cent, 20 per cent, and 10 per cent, respectively. Almost all cases respond dramatically initially; but relapse, either early or late, is common. A part of the therapy of meningeal cases has been intrathecal administration of streptomycin, 50 mgm. every second or third day (larger doses intrathecally have caused severe neurologic complications), continued for many weeks.

Other Tuberculous Conditions

Less experience has been accumulated in the therapy of other tuberculous conditions, and only brief comment is warranted. Streptomycin appears to be only mildly beneficial in empyema, either tuberculous or mixed. Results are encouraging in treatment of tuberculosis of the eye and of the skin, slightly less so in tuberculous pericarditis, but very encouraging and even dramatic in treatment of tuberculous peritonitis.[3,4]

Surgical Prophylaxis

As an investigation of a different kind of action of streptomycin, the Veterans Administration has explored the usefulness of the antibiotic as a protection against spread of pulmonary tuberculosis in patients undergoing thoracic surgery for such conditions. The regimen adopted[2] has been to give the drug for one week prior to surgery, and to continue it until two weeks after surgery (after the last stage, in the case of thoracoplasty). In the case of patients undergoing pneumonectomy and lobectomy, streptomycin protection has been afforded all cases. In the case of patients undergoing theracoplasty, the protection has been given to every other patient, on a strictly alternate basis, with the alternate cases not receiving streptomycin serving as controls for the streptomycin-protected cases.

Some figures from the Veterans Administation program are as follows[4]: In 249 thoracoplasty controls (with a total of 648 stages), there were 36 spreads, an incidence of 14.4 per cent per patient (or 5.6 per cent per operation). In 258 streptomycin-protected cases (with a total of 699 stages), there were 14 spreads, an incidence of 5.4 per cent per patient (or 2.0 per cent per operation). The Minneapolis figures are roughly comparable: 19 controls, 2 spreads (10.5 per cent per patient); 19 streptomycin-protected cases, 1 spread (5.3 per cent per patient). These figures would suggest that protection with streptomycin before and for a short period of time after thoracic surgery reduces the incidence of spread to a figure about half that in non-streptomycin-protected controls. It is not clear, however, that such is actually the case, as probably early spreads occur more frequently in streptomycin-protected cases than the figures indicate, and are so suppressed by streptomycin as to make recognition more difficult. Further, with 7 to 8 weeks of streptomycin treatment for the average thoracoplasty case, 40 to 50 per cent of the cases develop resistance to streptomycin, and it is questionable whether the relatively little greater protection thus afforded justifies the development of this amount of bacterial resistance. (See section on Resistance below.) In control cases experiencing post-operative spreads, it is the common experience that the extensions of the disease respond well to steptomycin therapy. With so small a difference in incidence of spreads between the two groups, the best management may prove to be to treat spreads as they occur without streptomycin protection, and not to jeopardize future usefulness of steptomycin therapy by attempting protection of all thoracoplasty patients.

As stated, patients undergoing resection for pulmonary tuberculosis, either by pneumonectomy or lobectomy, were not alternated with control cases. Current Veterans Administration figures[4] indicate that in 53 pneumonectomy cases receiving streptomycin, there were 2 post-operative spreads (3.8 per cent), and in 77 lobectomy cases there were 2 spreads (2.6 per cent); or, in a total of 130 resections receiving streptomycin protection for a period of three weeks (one week preoperatively, two weeks post-operatively), 4 spreads occurred (3.1 per cent). The Minneapolis Study Unit has experienced no spreads in six pneumonectomies and three lobectomies to date. The figures given for spreads with streptomycin protection are appreciably lower than figures quoted in the literature for cases operated upon without streptomycin protection. Because streptomycin is given for relatively short periods, and resistance is unlikely to develop, and because of a definite reduction of spreads with streptomycin protection immediately pre- and post-operatively, it seems justifiable to continue with this type of adjuvant therapy, or prophylaxis, in cases of pulmonary tuberculosis undergoing the severe strain of pulmonary resection.

DOSAGE AND FREQUENCY OF ADMINISTRATION

Streptomycin is a toxic drug (see below for discussion of Toxicity), much more so than penicillin, and there is a relatively narrow margin between doses which are clinically effective and those which are associated with toxic manifestations. At the start of the Veterans Administration streptomycin program, 1.8 grams per day (0.3 gm. q. 4 hrs.), and then 2.0 grams per day (0.4 gms. q. 4 hrs. except 4 a.m., or five times a day), for a total of 120 days, were the standard regimens. On these schedules the incidence of toxicity, especially of vertigo, and the associated diminished response to caloric stimulation, were considerable. In the past year, three other regimens have been employed: 2 gms. day (0.4 x 5), for 60 days only; 1 gm. day (0.2 x 5), for 120 days; and 1 gm. day (0.5 x 2) for 120 days. These regimens have been in effect long enough now for certain conclusions to be made.

It is as effective to give 1 gram a day in 2 doses as in 5 doses—no appreciable difference in results is measurable. And 1 gm. a day seems to be quite as effective therapeutically as the larger amounts (1.8 or 2.0 gms.). A few figures will support this observation[4]:

	Number of Cases Treated		Per Cent of Cases Improved at End of Therapy	
Tuberculous Condition	2 gms./day	1 gm./day	2 gms./day	1 gm /day
Sinuses and Fistulae	244	270	95	93
Laryngeal	61	90	84	90
Tracheo-bronchial	62	45	90	90
Lymphadenitis	17	17	88	76
Pulmonary	375	398	81	79

These comparisons apply to cases treated for 120 days, on the two dosage regimens. Fewer cases have been treated on 2 gms. day for only 60 days, and these are chiefly pulmonary cases. It is nevertheless interesting to note, in comparison to the above 120-day results, that these cases show 83 per cent improvement at the end of treatment—almost identical with the 1 gm./day and 2 gms. day for 120 days regimen. There thus is a strong indication for further exploration of regimens of shorter duration.

The second striking finding, as the result of administering 1 gram a day instead of 2, is that the incidence of toxic reactions is appreciably reduced.

TOXICITY

Because of the high incidence of toxic reactions on the larger doses of streptomycin originally employed, careful laboratory control of all cases under treatment was indicated. In addition to determining streptomycin blood levels at regular intervals, the following tests were performed regularly on all cases: tests for renal function (PSP or urea clearance); complete urine analysis; differential blood counts (especially to detect eosinophilia); caloric stimulation (vestibular function); audiograms; and routine bacteriologic determinations, sedimentation rates, and pertinent roentgenography.

The incidence of toxic reactions, and the percentage of cases in which it was necessary to stop or interrupt streptomycin therapy, is given for both the 2 gm./day and the 1 gm. day regimens:[4]

Toxic Manifestation	(Per Cent) 2 gms./day in 5 doses	(Per Cent) 1 gm./day in 2 doses
No. of Cases	671	445
Vertigo	80	23
Abnormal response, caloric stimulation	61	29
Eosinophilia (over 6 per cent)	63	35
Renal irritation (Cylindruria)	33	11
Impairment of renal function	9	6
Gastro-intestinal disturbances	16	5
Paresthesia	18	4
Loss of hearing (Audiom.)	14	9
Fever	6	2
Dermatitis (severe)	5	1
Blood dyscrasia	1	1
Therapy stopped or interrupted	15	4

There are indications that on the 0.5 gm. day regimen under present exploration the incidence of toxicity will be still further reduced.

DEVELOPMENT OF BACTERIAL RESISTANCE TO STREPTOMYCIN

An alarming accompaniment to the beneficial effects of streptomycin therapy in the treatment of tuberculosis has been the observation that the tubercle bacilli become resistant to concentrations of streptomycin far above those obtainable in a patient's blood stream and tissues, in a high percentage of cases. The rate of development of this resistance to streptomycin appears to be a function of time, and it has not yet been determined as to just when the greatest rate of development of resistance occurs. Some preliminary figures are[3]:

Organisms Resistant to 10 mcgm. per cc. at various intervals	Per Cent Cultures Resistant 2 gms./day	1 gm./day
At 60 days of treatment	35	33
At 90 days of treatment	70	74
At 120 days of treatment	83	96

For purposes of this tabulation, 10 micrograms per cc. is considered to be about as high a concentration as can be obtained in patients, on the average, without too great danger of toxicity. Slightly lower percentages of organisms will be resistant at each time interval if higher streptomycin concentrations are employed as criteria, but the danger of toxicity is increased when such levels are attained clinically.

Variations in percentages between the two regimens are not statistically significant, and it is apparent that lowering the daily dosage from 2 grams to 1 gram a day has not affected the problem of the development of resistance to streptomycin. Preliminary experience with 0.5 gram a day is to the same effect. It is therefore probable that shorter periods of therapy will be strongly indicated, from this standpoint if from no other.

There is no definite evidence that bacterial resistance to streptomycin, once established, will revert to sensitivity to the antibiotic. Assuming the irreversibility of this process, it must be assumed that once streptomycin has been given long enough for the tubercle bacilli to become resistant, streptomycin therapy no longer will be effective, for any further tuberculous condition. It therefore behooves the medical profession not to use streptomycin lightly, and to keep this consideration constantly in mind.

In the discussion of the effect of streptomycin on various tuberculous conditions, the observation has been repeatedly made that initial improvement has been followed by progression of the disease at a later date. In all probability this is closely associated with the development of resistance to streptomycin. Adequate data are not yet available fully to substantiate this statement, but there is a strong suggestion that such is the case. From the experimental standpoint there is even some indication that further treatment with streptomycin after

TABLE: RESULTS ON TREATMENT-TERMINATED CASES IN MINNEAPOLIS

A. AT END OF STREPTOMYCIN THERAPY

Type of Tuberculosis and Regimen	Objective Results of Therapy						Average Post-SM Observation (Mos.)
	Healed	Improved	Unchanged	Worse	Total	Dead	
PULMONARY							
2 gm./day for 120 days	..	9	1	..	10	..	0
2 gm./day for 60 days	..	6	2	1	9	..	0
1 gm./day for 120 days	..	12	..	..	12	..	0
TRACHEO-BRONCHIAL							
2 gm./day for 120 days	..	6	..	..	6	..	0
1 gm./day for 120 days	2	..	..	..	2	..	0
LARYNGEAL							
2 gm./day for 120 days	2	6	2	..	10	1	0
DRAINING SINUSES							
2 gm./day for 120 days	1	..	..	..	1	..	0
1 gm./day for 120 days	1	..	..	..	1	..	0
FISTULAE							
2 gm./day for 120 days	..	1	..	..	1	..	0
1 gm./day for 120 days	4	3	..	..	7	..	0
LYMPHADENITIS							
2 gm./day for 120 days	5	1	..	..	6	..	0
1 gm./day for 120 days	1	..	..	..	1	..	0
BONE-JOINT-CARTILAGE							
2 gm./day for 120 days	..	2	2	1	5	..	0
1 gm./day for 120 days	..	3	3	1	7	..	0
GENITO-URINARY							
2 gm./day for 120 days	1	6	2	1	10	..	0
1 gm./day for 120 days	..	1	..	1	2	..	0
OROPHARYNX (Tongue, Tonsil, Pharynx)							
2 gm./day for 120 days	3	..	..	..	3	..	0
1 gm./day for 45 days	1	..	..	..	1	1	0
ENTERITIS							
2 gm./day for 120 days	3	..	..	..	3	..	0
1 gm./day for 120 days	2	..	..	..	2	..	0
MILIARY-MENINGITIS							
2 gm./day for 150-180 days	..	5	..	..	5	..	0
EMPYEMA							
2 gm./day for 120 days	..	2	..	..	2	1	0
1 gm./day for 120 days	..	1	..	..	1	..	0
PERICARDITIS							
2 gm./day for 120 days	..	1	..	..	1	..	0
SKIN (Scrofuloderma)							
2 gm /day for 67 days	1	..	..	..	1	..	0
PERITONITIS							
1 gm./day for 42 days	..	1	..	..	1	..	0
OTITIS MEDIA							
2 gm./day for 120 days	1	..	..	..	1	..	0
1 gm./day for 44 days	1	..	..	..	1	..	0
TOTALS	29	66	12	5	112	3	0

(Continued on page 290)

B. CURRENT STATUS (Including Post-Streptomycin Observation)

Type of Tuberculosis and Regimen	Objective Results of Therapy						
	Healed	Improved	Unchanged	Worse	Total	Dead	Average Post-SM Observation (Mos.)
PULMONARY							
2 gm./day for 120 days	..	4	..	6	10	6	8
2 gm./day for 60 days	..	9	..	..	9	..	4
1 gm./day for 120 days	..	12	..	..	12	..	1
TRACHEO-BRONCHIAL							
2 gm./day for 120 days	..	6	..	..	6	..	8
1 gm./day for 120 days	2	..	..	..	2	..	1½
LARYNGEAL							
2 gm./day for 120 days	4	4	2	..	10	2	5½
DRAINING SINUSES							
2 gm./day for 120 days	1	..	..	..	1	..	8
1 gm./day for 120 days	1	..	..	..	1	..	3
FISTULAE							
2 gm./day for 120 days	1	..	..	..	1	..	8
1 gm./day for 120 days	6	1	..	..	7	1	8
LYMPHADENITIS							
2 gm./day for 120 days	6	..	..	..	6	..	5½
1 gm./day for 120 days	1	..	..	..	1	..	2
BONE-JOINT-CARTILAGE							
2 gm./day for 120 days	..	3	2	..	5	..	6½
1 gm./day for 120 days	1	3	2	1	7	..	3
GENITO-URINARY							
2 gm./day for 120 days	1	7	1	1	10	..	7
1 gm./day for 120 days	..	1	..	1	2	..	1
OROPHARYNX (Tongue, Tonsil, Pharynx)							
2 gm./day for 120 days	3	..	..	..	3	..	5½
1 gm./day for 45 days	1	..	..	..	1	1	0
ENTERITIS							
2 gm./day for 120 days	3	..	..	..	3	..	3
1 gm./day for 120 days	2	..	..	..	2	..	2
MILIARY-MENINGITIS							
2 gm./day for 150-180 days	2	..	..	3	5	3	10
EMPYEMA							
2 gm./day for 120 days	..	2	..	..	2	1	4
1 gm./day for 120 days	..	1	..	..	1	..	0
PERICARDITIS							
2 gm./day for 120 days	..	1	..	..	1	..	7
SKIN (Scrofuloderma)							
2 gm./day for 67 days	1	..	..	..	1	..	9
PERITONITIS							
1 gm./day for 42 days	..	1	..	..	1	..	1
OTITIS MEDIA							
2 gm./day for 120 days	1	..	..	..	1	..	9
1 gm./day for 44 days	1	..	..	..	1	..	0
TOTALS	38	55	7	12	112	14	5.2

resistance of organisms has developed is harmful. From the clinical standpoint, the observation has frequently been made that after resistance has developed, continued streptomycin therapy is often followed by an unfavorable course. Further careful study of this relationship is strongly indicated, and the future course of streptomycin therapy in the treatment of tuberculosis will be guided by the results of such study.

From consideration of the important factors of therapeutic efficacy, toxicity, and development of resistance, a clearer picture of the role of streptomycin in the therapy of tuberculosis is emerging, particularly with respect to dosage and duration of therapy. As has been shown, not more than 1 gram a day is needed for therapeusis, and injections as infrequently as every 12 hours are adequate; toxicity is a lessened problem with smaller doses, though careful observation continues to be indicated to avoid serious complications; but development of resistance remains a serious problem, even on doses of 1 gram or 0.5 gram a day.

Since October, 1947, certain Veterans Administration Study Units have been exploring a regimen of 0.5 gms./day (0.25 gm. b.i.d.) in certain types of tuberculosis. Preliminary reports[4] suggest that this dose may be as effective as 1 gram a day. Toxicity appears to be still less a problem than with the 1 gram regimen but the rate of development of resistance on this small dosage appears to approximate that of the larger dosage regimens. It is now planned to explore shorter periods of treatment, as 42 days, within the Veterans Administration streptomycin program, to investigate the possibility of achieving reasonably satisfactory therapeusis while avoiding the development of bacterial resistance to the antibiotic to the greatest possible extent.

RESULTS OF TREATMENT IN THE MINNEAPOLIS HOSPITAL

In the general discussion of treatment of various tuberculous conditions with streptomycin, reference has been made to the general experience of the group of Study Units as a whole. The results at the Minneapolis Veterans Administration Hospital are similar in most respects. The results on treatment-terminated cases only in Minneapolis are shown in the table on pages 288 and 289.

The figures given in foregoing sections, for both the larger group of Study Units and the Minneapolis Unit, stress the results achieved at the end of streptomycin therapy. As has been indicated, particularly in the discussion of pulmonary cases, the later results are, of course, of equal if not greater importance. Such results are not available in detail for the larger group, but have been indicated in Part B of the table for Minneapolis. Comparison of Parts A and B of the table will indicate the course of various types of tuberculous lesions between the end of treatment and the latest observation (as of March 31, 1948), indicating the average duration of post-streptomycin observation of each type of case.

Such comparison will indicate that, in the Minneapolis experience, the following types of tuberculous conditions have demonstrated continued improvement after terminating streptomycin therapy: laryngitis, fistulae, lymphadenitis, and bone and joint tuberculosis; there is little change in several types, chiefly those in which maximal effect has been achieved during therapy: draining sinuses, alimentary tract, skin, peritonitis, otitis media, tracheobronchitis, and genito-urinary tuberculosis; and progression is noted in the post-streptomycin period in such conditions as miliary, meningeal, and pulmonary tuberculosis.

It is to be emphasized that the figures given reflect the results of therapy not judged on a subjective basis but on as objective a basis as possible—on X-ray and endoscopic observations for the most part.

Examination of the Minneapolis results, as given in the table, indicates a fairly close degree of conformity with the results from the larger Veterans Administration investigative program, as stated in foregoing sections. To indicate this uniformity, a table is presented in which the effectiveness of streptomycin is expressed, for different tuberculous conditions, in percentage of improvement obtained (including healing if present), and these have been ranked in approximate order of descending effectiveness:

APPROXIMATE RANK OF EFFECTIVENESS OF STREPTOMYCIN IN VARIOUS TUBERCULOSIS CONDITIONS

(as judged by percentage of improvement)

Tuberculous Condition	20 V. A. Study Units	Minneapolis V. A. Hospital
GROUP A: EFFECTIVE (85%-90% Improvement):		
Sinuses and Fistulae	1	3
Alimentary Tract (Oropharynx, Intestine)	2	2
Laryngeal	3	4
Tracheo-bronchial	4	5
Glandular	5	1
GROUP B: MODERATELY EFFECTIVE (60%-80% Improvement):		
Genito-Urinary	6	7
Other (Skin, Eye, Pericardial, Peritoneal, etc.)	7	6
Empyema	8	8
Pulmonary	9	9
GROUP C: LIMITEDLY EFFECTIVE (30%-45% Improvement):		
Bone, Joint, and Cartilage	10	10
Miliary and Meningeal	11	11

The Minneapolis Veterans Administration Hospital has been employing the smaller dosage regimen, of 1 gm./day for 120 days (except 0.5 gm./day, 120 days, in the treatment of tuberculous sinuses) since October 15, 1947. The first cases so treated have only recently completed therapy, and it is as yet premature to report on their results, but it may be stated, in general terms, that results seem comparable to, if not superior to, those on the larger dosage regimens named above, and the incidence of toxicity is appreciably reduced.

SUMMARY

1. Streptomycin has been used in the treatment of various tuberculous conditions at the Minneapolis Veterans Administration Hospital since February, 1947, as a part of the cooperative investigative program of the Veterans Administration, the Army, and the Navy. Streptomycin therapy has been completed in 112 cases in Minneapolis, exclusive of therapy given surgical cases as prophylaxis.

2. In Minneapolis, as in the larger joint investigative program, streptomycin has been found to be an effective form of therapy in supplementing other standard forms of treatment in various tuberculous conditions. In tuberculous sinuses and fistulae, in tuberculosis of the alimentary tract, in laryngeal and tracheo-bronchial tuberculosis, and in tuberculous lymphadenitis, streptomycin therapy is associated with improvement and/or healing of the local tuberculous lesion in between 85 per cent and 90 per cent of the cases treated. In other tuberculous conditions, such as pulmonary, genito-urinary (especially renal), and the rarer medical forms of tuberculosis, streptomycin therapy is less effective, being associated with

improvement in between 60 per cent and 80 per cent of the cases treated. Streptomycin is still less effective in producing healing or improvement in tuberculosis of bone, joint, and cartilage; and in miliary and meningeal tuberculosis (30 per cent to 45 per cent improvement), but in the latter conditions achieves results so superior to other forms of therapy that its effect must be regarded as phenomenal. Streptomycin employed prophylactically in patients undergoing thoracic surgery appears to have some suppressive effect on the incidence of post-operative spreads: a marked effect in the case of pneumonectomy and lobectomy, less so in the case of thoracoplasty.

3. Various dosage regimens have been employed and their results studied. A daily dose of 1 gram appears to be as effective as larger doses earlier employed (1.8 and 2.0 gms. day). Injection in 2 doses a day appears to be as effective as in 5 or 6 doses a day. Some evidence has been presented that cases treated for only 60 days have as favorable an outcome as those treated for periods up to 120 days. Regimens employing still smaller doses (0.5 gm. day, or less), and for shorter periods (60 days, and less), are being tested.

4. The incidence of toxicity has been appreciably reduced with the demonstration that daily doses not larger than 1 gram are efficacious. Vertigo and evidence of vestibular damages are one-fifth as frequent on 1 gram a day as with 2 grams a day. It is possible that toxic manifestations will be still less frequent on regimens under present study, but they remain sufficiently prominent to require careful laboratory and clinical observation whenever streptomycin therapy is used in tuberculosis.

5. On all of the dosage regimens so far employed, the development of resistance to streptomycin, on the part of the patients' tubercle bacilli, to concentrations of streptomycin above levels therapeutically possible, is an alarming observation. The greatest rate of development seems to be after about 45 days of treatment, but may be somewhat earlier. There is strongly suggestive evidence that streptomycin therapy continued after such bacterial resistance to the antibiotic has developed is associated with no further benefit at best, or with a progressive course of the disease at worst. Further, if the phenomenon of resistance to streptomycin is an irreversible one, as most evidence suggests, once such resistance has developed it is not possible to employ the drug with benefit after its development, for possible future even greater need. The need for a regimen which will combine clinical effectiveness, a low rate of toxicity, and avoidance of the development of resistance, is acute. Such a regimen has not as yet been developed, although investigation of possibilities continues. Until it has been, it is necessary that the medical profession employ streptomycin in the treatment of tuberculosis with caution and reserve.

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SYMPOSIUM ON STEROID HORMONES

The final plans for the Symposium on Steroid Hormones to be held at the University of Wisconsin from September 6 through 8, 1948 have been announced by Dr. Edgar S. Gordon, Chairman of the Symposium Committee and Associate Professor of Medicine at the Medical School of the University of Wisconsin. This symposium is a part of the Centennial celebration of the Wisconsin State University and the final program is exceedingly comprehensive. It includes the chemistry, metabolism, and biological effects of the steroid hormones, and the clinical applications of these substances are discussed in detail. Scientists from many of the representative universities and medical schools throughout this country are included in this program and the University of Edinburgh is represented by Dr. G. F. Marrian and Canada is represented by Dr. Harry Guttridge and Eleanor Venning of McGill University.

The meetings of this symposium will be open to the general public and physicians, chemists, and scientists from other fields are invited to participate. No registration fee is to be charged.

Facilities for the accommodation of those who are going to attend the symposium are available in Elizabeth Waters Hall on the Wisconsin campus overlooking Lake Mendota. Board and room are available at $16.25 for the three-day period of the symposium. This meeting is presented under the direction of the University of Wisconsin and the National Research Council Committee on Growth acting for the American Cancer Society. The Wisconsin Medical School, McArdle Memorial Laboratory for Cancer Research, and the Department of Biochemistry of the University have organized the program.

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Editorial

POSITIVE EVIDENCE

The report in this issue of "Analysis by Decades of Morbidity and Mortality Trends in the Northwest Central Area" by Doctors Berdez and McLeod, Jr., of Duluth, gives irrefutable evidence of the form in which death comes to a cross-section of our people in this Northwest Central area. It is in many ways a far better sounding than any of the popular political or economic polls. It is a counting of the votes actually cast, but it should be a potent forecast of what is likely to happen year by year; because peoples, propensities, habits, exposures and geriatric limitations change but little, at least within decades. As to longer range changes, we know that life extension steadily advances more people into the zones of illness imposed by cancer and vascular disease. The listing decisively support what we all experience—the gradual disappearance of the "efflorescent" transmissable killers of the young, such as scarlet fever and diphtheria, that were so prevalent at the turn of the century. What we forget is that the morbidity imposed by early infections often comes to the surface in later life, such for example as the nephritides. Note the absence of any such in this group.

Nine cases are listed with "Calcific Aortic Disease"—a situation much mooted in terms of rheumatic etiology or senescent association. In any case, we may quote Pathologist Arthur Wells, "Aortic stenotic disease is the most common valvular defect found at autopsy in this Minnesota area." A review of deaths attributable to "accident" uncovers not a few that are clearly suicidal and suggests others where no decision is justifiable. This hints at the prevalence of psychosomatic disorders whether dominant or in association with demonstrable organic disease. E. L. T.

The American College of Physicians Announces Its Annual Session at New York City March 28 - April 1, 1949

The American College of Physicians will conduct its 30th Annual Session at New York, N. Y., March 28 through April 1, 1949. Dr. Franklin M. Hanger, Jr., of New York City is the Chairman for local arrangements and the program of Clinics and Panel Discussions. The President of the College, Dr. Walter W. Palmer, Director of The Public Health Research Institute of the City of New York, Inc., and Professor Emeritus, Columbia University College of Physicians and Surgeons, is in charge of the program of Morning Lectures and afternoon General Sessions.

Secretaries of medical societies are especially asked to note these dates and, in arranging meeting dates of their societies, to avoid conflicts with the College Meeting, for obvious mutual benefits.

American Student Health Ass'n

TOUCH FOOTBALL

In an attempt to lower the number and the severity of injuries in this sport, the Athletic Committee of Ohio Wesleyan University has adopted the following rules for touch football.

1. Each team shall consist of eight (8) men.
2. Regular football cleats may be used.
   Prohibited are: (a) baseball cleats, (b) track shoes, (c) rain cleats, (d) metal cleats.
3. One man will be required to tag the ball carrier. He must be touched by both hands, at the same time, above the waist and below the neck.
4. All men are eligible to receive a pass.
5. Each team shall have its own side of the field and substitutions will be made from that side of the field and that side only. Penalty 5 yards.
6. Each team is limited to six downs in which to move the ball the length of the field.
7. Any punt on sixth down must be a called punt and it must be so declared before the offensive team lines up over the ball.
8. The defensive team must have four men on the line of scrimmage until after the ball has been kicked.
9. Any number of forward passes may be thrown behind the line of scrimmage but only one may be thrown past the line of scrimmage.
10. Until the ball is snapped, all linesmen must have their hands on knees and elbows must be straight.
11. Tie games: In case of a tie game, winner shall be determined according to the following procedure: The ball shall be placed in the center of the field. A coin shall be tossed and the winner of the toss may elect whether to go on the offense or defense on the first play of the post-game series of plays. Each team shall be given three plays alternating in turn, i. e., A team tries to advance ball toward B's goal on its first play; B team puts ball into play at the point where ball was declared dead after A's first play, and tries to advance ball into A's territory, B then makes second play, etc. The team that has advanced the ball into the opponent's territory at the end of the sixth play shall receive one point in case of a tie and be declared the winner.

If a score is made before the sixth play it does not immediately end the game, the ball being played in alternating turn throughout the balance of the plays with the scoring play counting as one play for the team last putting the ball into play. If at the end of the six plays the score is tied another series of six plays shall be allowed. No kicking, except try-for-point after touchdown, is permitted in the tie games series of six plays.

NEWS

Mr. Phil B. Narmore, executive dean, Georgia School of Technology, Atlanta, Georgia, is looking for a doctor as director of the Student Health Service in this institution. The Health Service, including a 36 bed infirmary, serves 5,400 students. The equipment is excellent. The position pays between $6,000 and $7,000.

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. . . MEET OUR CONTRIBUTORS . . .

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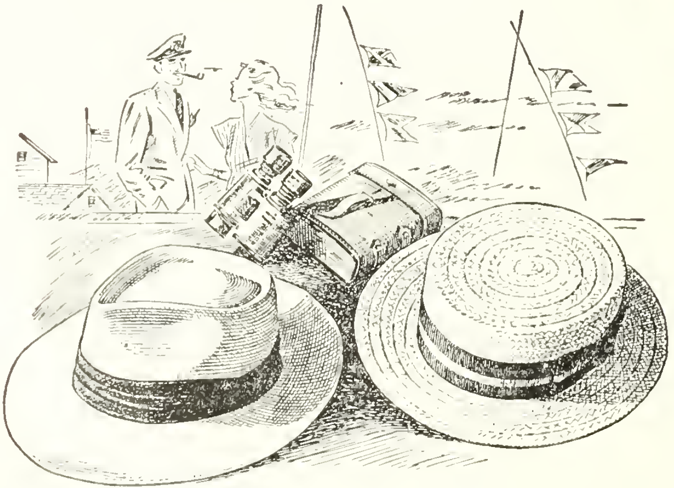

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PREPARATION OF MANUSCRIPTS

JOURNAL-LANCET extends an invitation to the profession for articles with the understanding that they are original contributions not previously published.

Manuscripts are to be typed on one side of the paper with double spacing. Illustrations must be in the form of glossy prints or drawings in black ink. Please do not attach legends to the pictures. A reasonable number (two or three) illustrations are published free of cost; special arrangements must be made for excess or highly finished illustrations or tables.

Bibliographic references should be at the end of the manuscript and not in footnotes. Each reference should include the following information in the order indicated: Name of author with initials; title of article; name of periodical; volume, page and year. Reprints are prepared on order.

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Lung Cysts

Nathan Kenneth Jensen, M.D.
Thomas J. Kinsella, M.D.
Minneapolis, Minnesota

Lung cysts have many origins and are equally diverse in their development. By definition a cyst is a sac containing fluid or air or both. General pathological usage pays little heed to what structures constitute the wall of a cyst, for example, omental cysts, ovarian cysts, pancreatic cysts. Nothing in these or in many other examples that might be cited is required of the sac or wall of the cyst except that it serve to contain. Cysts in general then may be considered as abnormal tissue spaces of sufficient size to be macroscopically conspicuous arising either by replacement or displacement of the surrounding normal tissues and containing non-viable, acellular material, solid, liquid, or gaseous.

It is this generality of the term cyst that makes anatomical classification of lung cysts controversial and unsatisfactory. Etiological classification is likewise not entirely satisfactory, yet if it is combined with anatomical considerations a workable clinical classification can be made, albeit to the discomfort of the purist.

Classification of Lung Cysts

A. Parasitic Cysts: (Pseudo cysts?)
  1. Hydatid cysts (Taenia echinococcus)
  *2. Amebic cysts (Entameba histolytica)
  *3. Bacterial cysts (Tuberculosis, coccidiosis, mixed anaerobic-aerobic infections)
B. Neoplastic Cysts:
  †1. Carcinomatous cysts (primary or metastatic)
  2. Adenomatous cysts (cystic fetal bronchial adenoma)
  ‡3. Angiomatous cysts
    a. Lymphangioma (cystic hygroma of lung)
    b. Hemangioma (secondary cyst formation)
C. Congenital or Developmental Cysts:
  1. Defects in anlagen of the pulmonary system.
    a. Enteric cysts (usually mediastinal)
    b. Bronchial cysts (frequently mediastinal)
    c. Cysts arising from atria, alveolar duct or air sac
  2. Defects in anlagen of the lymphatic vessels with production of mesothelial lined cysts
  3. Teratomas

Presented by Dr. N. K. Jensen as inaugural thesis at the February 1948 meeting of the Minneapolis Academy of Medicine.

*The inclusion of these two conditions which are almost always called and thought of as abscesses may be challenged. However, abscesses due to destruction and replacement of tissue by entameba histolytica or by necrotizing bacterial infections are no less cysts than hydatid cysts are abscesses. Lung abscesses are in reality cysts which have gained sufficient recognition and understanding to be separated out of the general group and considered apart primarily because of the problem presented by the infectious process. Let an emphysematous bulla become infected and it promptly is a lung abscess as well as a cyst. Likewise, tuberculous cavities and equally those of coccidiosis are cysts which have gained sufficient distinction to be considered apart on the separate basis of their specific etiology.

†Less were recognized than the aforementioned examples of specialized lung cysts is the peripheral carcinoma, either primary or secondary, which becomes necrotic in its center. If the necrotic material is evacuated through a bronchus, a cystic space containing air and frequently fluid results. A lung abscess of a kind has developed, but also a lung cyst.

‡Cystic lymphangioma of the lung come about presumably much the same as they do in other places. They, like the hemangiomas, have their origin from a rudiment which was destined to form vessels and they develop independently of the surrounding normal vascular channels. Hemangiomas do not have as

D. Mechanical Distension Cysts (Emphysematous)
  1. Cysts developing as result of segmental overdistension of alveolar tissue due to valve-like incomplete bronchial obstruction.
    a. Emphysematous blebs
    b. Emphysematous bullae
    c. Vanishing lung?

This classification has been purposely broadened to include pathological conditions ordinarily not considered as lung cysts and the accompanying footnotes have been long in a defense of their inclusion for a definite reason. The clinical recognition of lung cysts depends almost entirely upon the roentgenological examination of the chest, and the demonstration of a roughly circular shadow having a fairly distinct border lying within a lung field brings up all the possibilities suggested by the foregoing classifications. Finally, it will frequently sorely puzzle the pathologist to distinguish between an infected lung cyst and a chronic lung abscess which has become epithelialized.

It necessarily follows then that the diagnosis of lung cyst alone is of no prognostic value nor can any therapy be considered until the exact type and nature of the cyst has been determined. Occasionally other features of the roentgen examination give us all the answers, sometimes other clinical data complete the story, but for the most part the cyst must be removed before its true nature is known.

Diagnostic Features

Echinococcus Cysts: Fortunately, echinococcus cysts are rare in this country. However, this may no longer be a safe assumption in eliminating the diagnosis for many of our troops occupied countries in which the disease is frequent, particularly Iceland and Australia. There is nothing characteristic or diagnostic about the X-ray shadow cast by a hydatid cyst. It is simply a dense mass of spherical or irregular shape which in this geographic location is more likely a neoplasm or an encysted non air-containing cavity of inflammatory origin.

Geographical location, history of dog loving, the presence of urticaria and eosinophilia, are suggestive. The diagnosis is made by the finding of hydatic elements in the sputum or by a positive Casoni test. The Casoni test is performed by the intradermal injection of hydatid fluid. A positive reaction is an immediate wheal with erythema, followed by local induration and diffuse reddening of the skin. Only 36 cases have been reported in the United States up to 1930, only 5 of these born in North America.

Amebic Cysts: Infection with entameba histolytica is more frequent than generally appreciated, particularly among ex-service men. Lung abscess can come about in two ways, either by rupture of a liver abscess into the lung, or by way of the hepatic veins. MacCallum cites a case of a thrombus occupying a hepatic vein and containing ameba breaking away to lodge in the lung and initiating a lung abscess. We have recently seen a similar case. Most amebic lung cysts however are secondary to subhepatic abscesses.

Amebic lung abscesses are not distinguishable by X-ray from other infected lung cysts and it is only by demonstrating the specific nature of the infection that the correct diagnosis is arrived at. The presence of a simultaneous right subphrenic abscess is very suggestive.

Tuberculous Cysts: A cystic space developing in pulmonary parenchyma as the result of tuberculous infection is referred to as a cavity, likewise those occurring in coccidioidomycosis. Generally the associated typical roentgen and clinical finding of tuberculosis leave little doubt as to the true nature of the process; however, secondary tuberculous infection of a cyst or cysts may occur and probably explains some of our failures with collapse therapy. More frequently, however, a relatively benign bullous cyst occurring in a tuberculous lung is labeled a tension cavity and its sudden appearance and great size wondered about.

Nevertheless, one must be very cautious in dismissing the likelihood of tuberculous cavitations in making the diagnosis of lung cyst or abscess involving the apical portions of either the upper or lower lobes. A tuberculous cavity can have remarkably little surrounding inflammatory accompaniment and occurring in a chest otherwise minimally involved by tuberculosis can simulate on X-ray study a simple lung cyst to a surprising degree. Unwise resections of such a "cyst" may lead to disaster.

Coccidioidomycosis: The cavitations of coccidioidomycosis are not so easily recognized as those of tuberculosis, probably in part because the disease is less well known, but also because the cavities form rapidly and are thin-walled with little surrounding inflammatory change. A history of residence in an endemic area or skin manifestations should put one on guard. Intradermal testing and serological tests are helpful but may be misleading. The organism can readily be cultured on Sabourand's media and further identified by animal inoculations. Finally, it is well to remember that these thin-walled cysts may remain indefinitely in cured cases.

Necrotizing Bacterial Lung Cysts: It is impossible to distinguish by roentgen examination alone a chronic lung abscess from an infected lung cyst. Usually the history of probable aspiration while anesthetized or stuporous from one cause or another is obtainable in bonafide lung abscesses. The aspiration episode is followed by a pneumonic stage, later merging into the period of the putrid bloody sputum characteristic of most lung abscesses. However the same clinical course may be seen in the development of a severe infection in a lung cyst, but generally the systemic reaction is less severe, the sputum less foul and bloody and one is impressed with the size of the abscess and its ease of development.

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great a propensity to become cystic as lymphangiomas for some reason. Cavernous forms develop with widely dilated intercommunicating spaces, but these are not truly cystic. However, as in all angiomata, circulatory disturbances may occur with thrombosis of the myriad channels of a good part of the tumor. Necrosis and frequently infection follows with formation of a cystic space on bronchial evacuation of the necrotic tissue.

Carcinomatous Cysts: Any thick-walled cyst or abscess occurring in the lung may be a carcinoma. These may come about either by carcinoma developing in a pre-existing cyst or by the cavitation of a spherical mass of malignant tissues. These are not frequent but must be kept in mind. Rarely are these lesions accessable for bronchoscopic biopsy and sputum examinations for malignant cells are only of value if positive. Usually microscopic examination of the cyst wall may be required to establish the correct diagnosis.

Adenomatous Cysts: True adenomatous cysts are rare. We have seen none. Lahlein has reported a true cystic papillary tumor of the lung and Stoerk and Grawitz have described marked epithelial proliferation in some cases of congenital cystic disease of the lung and have suggested that these may represent true fetal adenomata. Others have compared congenital cystic disease of the lung to cystic disease of the breast. We feel it is better to limit the term cystic adenoma to such cases as described by Löhlein.

Angiomatous Cysts: These are rare; we have seen one, possibly two hemangiomatous cysts. We feel they came about by thrombosis, necrosis, and cavitation. They contain old blood and are surrounded by hemangiomatous tissue. Both of our patients sought aid because of recurrent hemoptysis, raising first old blood, then bright red blood. Roentgen studies showed irregular densities of considerable size with central cavitation. Cyanosis, polycythemia and associated hemangiomata were not present.

Lymphangioma of the lung with cyst production are rare. Gross and others have described cystic hygromas of the mediastinum and involvement of the lung is known.

Developmental Cysts: Congenital or developmental cysts, by far the most frequent true cysts, occur in the pulmonary parenchyma and are fairly frequent in the mediastinum. The distinction between developmental cysts and those described as adenomatous lies in the lack of active epithelial tissue proliferation being responsible for the growth and dissemination of the developmental cyst. Whereas the adenomatous cysts develops as a result of the epithelial proliferation of the cyst wall, much as a Graffian follicle of the ovary or an ovarian cystadenoma, developmental cysts arise because of fetal malformation of the broncho-pulmonary system. Even so, it is difficult to know just where to classify congenital cystic disease of the lung. In this condition the lung or part of it is converted into a mass of cysts lined with high epithelium. These cysts are often several centimeters in diameter and many lack any bronchial communication, although the majority do communicate with bronchi. This condition is frequently called congenital telangiectatic bronchiectasis. Anatomically, however, it is clearly replacement of pulmonary tissue by multiple cysts usually associated with bronchiectasis or at least a striking lack of smaller bronchioles. If the disturbance in development occurred at the time of the budding of the larger bronchi so that only this phase of growth persisted, it would produce just such a structure as congenital cystic disease of the lung; multiple large cysts, large bronchi, absence of alveolar tissue.

Cysts arising from developmental disturbances affecting the larger bronchi show cartilage and muscle fibers in their wall and columnar or cuboidal epithelium. Frequently the latter is destroyed by infection and undergoes metaplasia. Similar cysts arise in the tracheo-esophageal area as well as cysts developing from rests of the primitive foregut out of which the pulmonary system develops. The bronchial cysts are as already described and may be attached to the bronchi, trachea or esophagus. Occasionally they communicate with a bronchus.

Cysts arising from terminal bronchioles and alveolar ducts will have muscle but lack cartilage. Those arising distal to this point are indistinguishable from emphysematous dilatations of these same structures. It is probable that many of these cysts are included with the emphysematous cysts.

Those arising from the foregut are enteric cysts and are lined with epithelium characteristic of the gastrointestinal tract with which they occassionally communicate. These occur in the mediastinum usually below the level of the bifurcation of the trachea.

Lymphatic Cysts: Developmental defects in the lymphatic system may result in the formation of cysts having thin walls and lined with mesothelium. These should be distinguished from lymphangiomas which show progressive development of cystic spaces by continued angiomatous growth. The cysts arising from mesotheal lined rests are usually single and contain clear sparkling fluid. They are often called "spring water" cysts.

Teratomas: Teratomas are mediastinal tumors but their involvement of bronchi and adjacent pulmonary tissue by ulceration or displacement and compression justify their consideration with lung cysts. The terms "dermoid" and "teratoma" are loosely applied to these tumors, but it is probably safer to consider these all as teratomas for as Ewing has pointed out: "A single origin though one-sided development of teratomas cannot be excluded for the entire group."

These tumors arise in the anterior mediastinum in front of the pericardium and great vessels, but the positions they assume later may be varied as they may be extruded from the mediastinum into either pleural cavity. They are usually adherent to adjacent structures and they frequently become malignant.

Mechanical Distension Cysts: This group of lung cysts are the most frequent, vary the greatest in size and have aroused the greatest controversy as to their origin and development.

Anatomically they all are similar. The cyst wall is formed of compressed alveolar tissue showing varying degrees of fibrosis and adjacent atelectasis. Frequently the wall is so thin as to be indistinguishable in ordinary roentgenograms and it is only with later thickening, usually due to the infiltration accompanying infection, that the cyst becomes visible in the X-ray film. Prior to this development their presence may be suspected by the presence of localized areas of increased radiability of the lung not following strictly bronchial segmental patterns.

These cysts are usually devoid of any epithelial linings, but they may develop an epithelial lining by ingrowth of bronchial epithelium much the same as chronic lung abscesses.

The general opinion is that these cysts develop as a result of slowly developing progressive overdistension of a segment of alveolar tissue due to a persistent valve-like one way bronchial obstruction. Alveoli rupture and coalesce to form the cystic spaces. Those developing next to the pleura are referred to as blebs while those deep in the lung are called bullae.

The disease is much more frequent in men than women and occasionally takes an acute form with destruction of an entire lung (vanishing lung). Spontaneous pneumothorax is common in this condition and may be very troublesome. In certain instances giant bullae may develop acutely, as infrequently seen in bronchial obstruction due to foreign bodies. Ballooning cysts of the newborn are of this type, due to some bronchial anomaly resulting in valve-like one way obstruction.

The most common case, however, is a middle aged man with moderately severe to severe generalized emphysema, chronic bronchitis and multiple areas of pulmonary destruction due to bullae and blebs of various sizes. In some, the surrounding alveolar tissue has become sufficiently compressed and fibrosed to be visible in the roentgenogram as a definite cyst wall; many others make their presence known by presenting only areas of greatly increased radiability with loss of parenchymal markings.

SUMMARY

The occurrence of cystic spaces in the mediastinum and lungs is fairly frequent. A wide variety of pathological processes is responsible and anatomical or etiological recognition is rarely possible from the roentgen study alone.

The clinical diagnosis of "lung cyst" is often misleading and inadequate in every sense. It is, unfortunately, impossible to make the proper diagnosis without histological study of the wall of the cyst or its contents. The contents of the cyst can be recovered in the sputum, in certain instances, by bronchoscopic aspiration and this information may complete the diagnosis, as, for example, the recovery of characteristic bacteria, fungi, ameba or tumor cells. In other instances, the cystic changes are part of a generalized pulmonary disease and should be considered as such; emphysematous blebs and bullae are a prime example.

Developmental cysts as a group do not have bronchial communications and, when they do, fail to discharge any typical material which will lead to their specific identification. These cysts are "true cysts" in the strict sense of having a specific epithelial lining. Their full identification usually requires surgical exploration and removal or biopsy. The dermoid discharging hair and teeth into a bronchus is so rare as to be almost mythical and at best only proves the rule.

NOTE: This paper is published here in semi-abstract form without illustrations or bibliography to meet the requirements of space and printing technicalities.

HEALTH EDUCATION FELLOWSHIPS

The American Cancer Society has authorized the expenditure of $10,000 for fellowships in health education. The present proposed plan is to offer eight fellowships of $2,500 each (to be borne half by the Society and half by the state division) for graduate study in any one of the five approved schools of public health which include Yale University and the State Universities of California, Michigan, Minnesota and North Carolina.

The national office will name a Committee on Fellowship Awards who will make final selections from names submitted by state divisions. The applicant must have a B.S. or B.A. degree from an accredited school along with other specific requirements.

The eight selected students will obtain a nine months' study period and three months' supervised field training. Divisions may be permitted to contact the applicant for two to three years of service at the completion of the year's fellowship.

In addition to the above mentioned eight fellowships, several of the state divisions have already offered full fellowships within their own state budget.

Submucous Lipomas of the Ileocecal Valve

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Lipomas of the gastro-intestinal tract have been reported in medical literature from time to time by a number of authors. These tumors have been found in all parts of the gastro-intestinal tract. Wiener and Polayes[10] reviewed 259 cases and classified them according to location as follows:

Esophagus	2
Stomach	31
Duodenum	19
Small intestines	68
Ileocecal region	9
Ileocecal valve	3
Cecum	23
Colon	60
Sigmoid	21
Rectum	12
Incomplete accounts	11

Relatively few cases of lipoma of the ileocecal valve have been recorded. In 1920 Jefferson[7] reported one patient in which a fibroma involved the ileocecal valve. A series of 181 cases of lipomas of the gastro-intestinal tract was reviewed by Comfort[2] in 1931 and in only two cases was the ileocecal valve the location of the lipomatous growth. In 1938 Wiener and Polayes[10] reported two cases. Golden[4] describes a case presented at one of the weekly clinical pathological exercises at the Massachusetts General Hospital which showed a filling defect in the ileocecal region and at operation a mass was found which after resection proved to be a submucous lipoma of the ileocecal valve. Weber,[9] at a recent meeting of the Minnesota Radiological Society, reviewed 22 cases of lipomas of the colon. The ileocecal valve was not involved in any of these patients. At the annual meeting of the Radiological Society of North America, Fleischner and Bernstein[3] demonstrated one case of lipoma of the ileocecal valve.

A brief review of the anatomy of the ileocecal valve shows that the distal end of the ileum enters the large intestine at its medial and posterior aspect and at the junction of the cecum with the ascending colon. The opening is guarded by a valve consisting of two lips projecting into the lumen of the large intestine. The lips are semilunar in shape. The segments of the valve coalesce and are continued as a narrow membranous ridge around the cecal canal for a short distance forming the frenulum of the valve. The blood supply is derived from the right colic and the ileocolic arteries. The nerve supply is furnished by the sympathetic nervous system (Meissner's submucosal plexus) and the parasympathetic, which is vagus in origin (Aurbach's mesenteric plexus). It is believed by some authors that the valve prevents reflux of large bowel contents back into the terminal ileum and slows up the passage of intestinal contents into the colon. The ileocecal valve is normally competent for food taken by mouth.[6,1]

From a clinical standpoint only about 50 per cent of patients with lipoma of the ileocecal valve present any clinical findings. The tumor is frequently an incidental finding during routine X-ray examination of the colon, at surgery, or at autopsy. The onset of symptoms depends largely on the size of the tumor mass and the degree of involvement of the ileocecal valve. Those patients presenting a clinical picture often complain of pain in the abdomen localized to the right lower quadrant which is often confused with acute appendicitis or appendiceal abscess. Thus, Jefferson's[7] patient complained of pain in the right lower quadrant and nausea and vomiting. These symptoms occurred intermittently over a period of three months, each attack lasting about three days. The diagnosis was appendiceal abscess. Fleischner's and Bernstein's[3] patient complained of rectal bleeding, tenderness and spasm in the right lower quadrant.

Wiener and Polayes[10] state that symptoms are due to several conditions as follows: "(1) interference with the intrinsic nervous mechanism of the gut wall, causing disordered peristaltic activity; (2) obstruction of the lumen; (3) intussusception; (4) ulceration of the lining mucosa or tumor itself, and (5) results of circulatory changes incidental to forceful peristalsis or intussusception."

The diagnosis of lipoma of the ileocecal valve is a difficult problem. No definite clinical picture has been described. A large percentage of these cases are diagnosed at surgery or at autopsy. Pollosson and Rougemont[8] describe a picture which they believe is characteristic of submucous lipoma of the ileocecal valve. These authors state that these patients have several attacks of abdominal pain which are moderately severe and colicky in character and occur periodically. During these attacks there is a complete abdominal relaxation with no distention or rigidity, and pulse and temperature are normal. If a tumor is felt on examination, appendiceal abscess or other inflammatory conditions can be ruled out.

X-ray examination offers perhaps the most accurate information. By means of barium and double contrast enemas a relatively small tumor mass can be discovered. The use of pressure cones and spot films during the X-ray examination will further help to define and localize the tumor.

Several conditions must be differentiated from lipoma of the ileocecal valve. These conditions can be classified as inflammatory, such as regional ileitis and tuberculosis with lymphoid hyperplasia or benign non-inflammatory

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Presented at the February 1948 meeting of the Minneapolis Academy of Medicine.

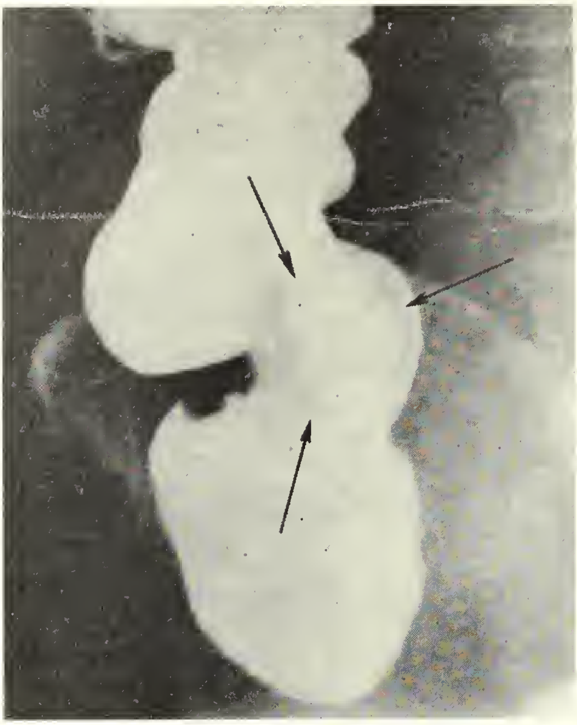

Fig. 1. Case No 1. Pre-evacuation film. Filling defect as indicated by arrows.

lesions such as intussusception, hypertrophic valve and edema.[5] Polyps and early carcinomas are difficult to differentiate from lipomas even by X-ray examination.

CASE REPORTS

The author wishes to present two cases of submucous lipoma of the ileocecal valve:

Case 1. A white female, age 56, came to a physician's office for a general examination. Her complaints were diarrhea and lower abdominal cramps. The patient stated that during the last year she had noted some bowel changes consisting of diarrhea. The onset was gradual but in the last three months she had become worse and at the present time was having four to six liquid stools daily. Intermittent abdominal cramps, more marked in the lower quadrant, were noted in the last few months. There was no weakness and no loss of weight. The past history was essentially negative except for a cholecystectomy in 1941 from which there was complete recovery.

The physical examination was also negative; no tenderness on palpation and no masses were noted. Laboratory examination showed that the routine urinalysis was negative. Blood study showed that the hemoglobin was 82 per cent, leukocytes 10,100, neutrophiles 59 per cent, lymphocytes 34 per cent, monocytes 4, eosinophiles 2 and basophiles 1 per cent.

X-ray examination of the gastro-intestinal tract showed a filling defect in the ileocecal region. The mass was well circumscribed and appeared to have a broad base. A benign tumor such as a large polyp or a lipoma was considered the most likely diagnosis but it was felt that an early carcinomatous lesion could not be ruled out. In view of these findings the surgeons decided that exploration was indicated. The patient entered the hospital April 13, 1947, and on April 19, 1947, a laparotomy was done. The pre-operative diagnosis was probable carcinoma of the cecum.

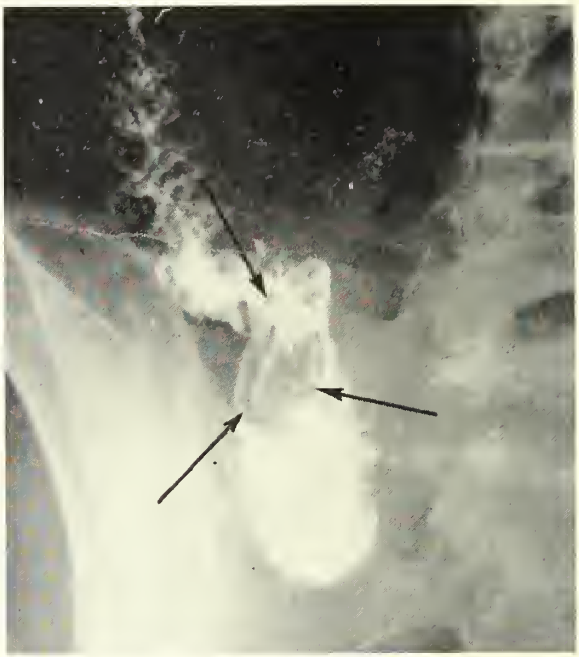

Fig. 2. Post-evacuation film.

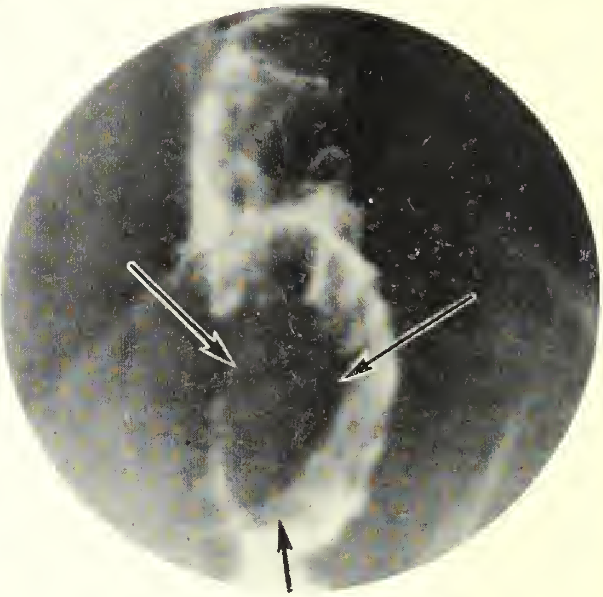

Fig. 3. Spot film showing defect.

Findings (Figs. 1, 2, 3): On opening the abdomen a pedunculated tumor could be felt through the cecal wall and appeared to have a broad base and to be

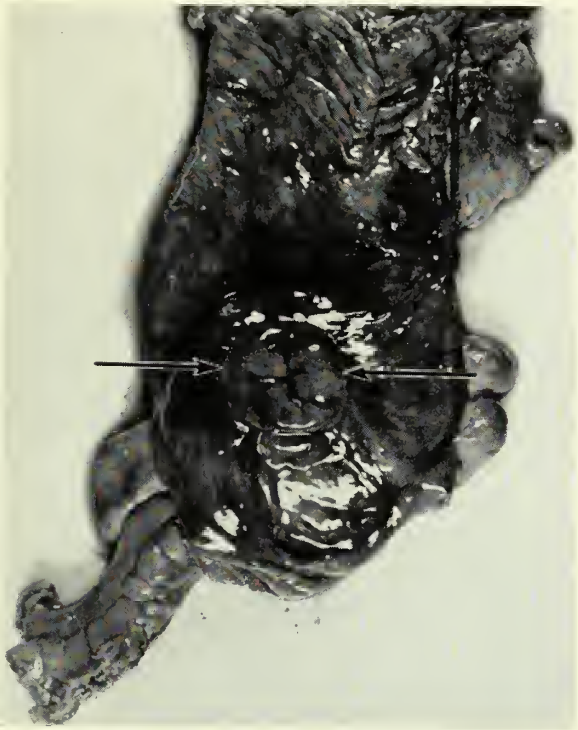

Fig. 4. Surgical specimen. Arrows indicate tumor.

located in close proximity to the ileocecal valve. The tumor appeared to be approximately 1 inch in length. There were no evidences of metastases into the regional nodes. The terminal ileum was normal and showed no evidence of inflammation.

Operation: A right rectus incision and exploration was made. The lesion was considered to be a pedunculated tumor, probaly malignant. For this reason the right colon was resected. The postoperative diagnosis was inflammatory lesion of the ileocecal valve.

Pathological examination was as follows: "The specimen consisted of the distal ileum, ileocecal valve and the ascending colon. Mucous membrane of the ileum and the cecum show no ulceration. The ileocecal valve is markedly thickened. It measures 29x30 millimeters and projects itself into the lumen of the cecum for a distance of 21 millimeters. The mucous membrane is intact. It has a distinctly yellowish color and on cross-section the marked thickening of the valve is due to fat which fills the entire submucosal zone. The fat is limited to the immediate ileocecal valve. About 3 centimeters beyond the valve there is a flat, yellow plaque which measures 13 millimeters in diameter and is about 7 to 8 millimeters in thickness. A very short distance above this the entire submucosal layer of the colon is thickened to 5 or 6 millimeters by diffuse fatty infiltration. The mucous membrane has become somewhat granular and lobulated due to this fat. The zone of fatty infiltration is about 6 centimeters in length. The fat throughout these deposits is limited to the submucosa. The outer layers and the muscle layers of the bowel show no involvement. The ileum proximal to the valve is not involved.

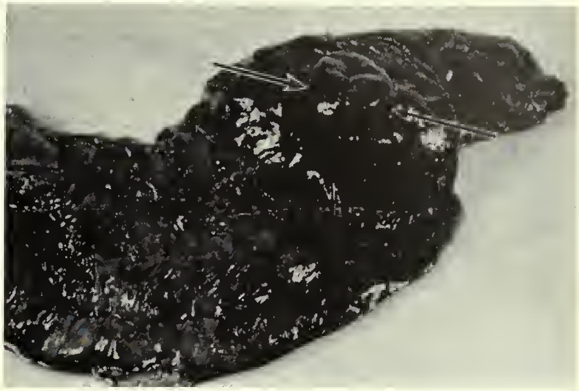

Fig. 5. Surgical specimen.

Microscopic sections from the various areas mentioned all show mature fat which has distended the submucous zone.

Diagnosis: Lipomatosis of the ileocecal valve and ascending colon." (Figs. 4, 5.)

Comments: This patient has had an uneventful recovery and is relieved of symptoms except for occasional diarrhea which is less severe. This suggests that the original symptoms were probably due to the ileocecal valve lipoma. It is likely that these symptoms were due to an attempt at intussusception secondary to the tumor, or a partial obstruction, or both.

Case 2. A white female, age 53, was admitted to the Surgical Service at the University Hospital October 16, 1945. In 1943 this patient had a cholecystectomy and exploration of the bile duct from which she recovered completely. The present admission was for repair of a fistulous tract present in the right lower quadrant incidental to appendectomy 30 years ago. At surgery a fecalith was found and removed. The sinus was curetted and packed with sulfathiazole gauze pack which was left in for three days. After removal of the pack the patient developed a small fecal fistula. No further surgery was undertaken at this time but in October 1946 she was again subjected to surgery and at this time a resection of the terminal ileum and cecum was performed with primary ileo-colostomy. The recovery was uneventful.

The surgeon's report made no mention of a tumor mass in the region of the ileocecal valve.

Pathological report: Among other findings the ileocecal valve was swollen and flabby and cut section appeared to consist mostly of fat. Search of the mesentery revealed several small soft nodes measuring about 5 millimeters in diameter. Microscopically the section through the ileocecal valve revealed that it consisted of loosely arranged connective tissue containing a large amount of fat and covered by normal appearing small bowel mucosa. Section through the lymph nodes revealed no evidence of metastases.

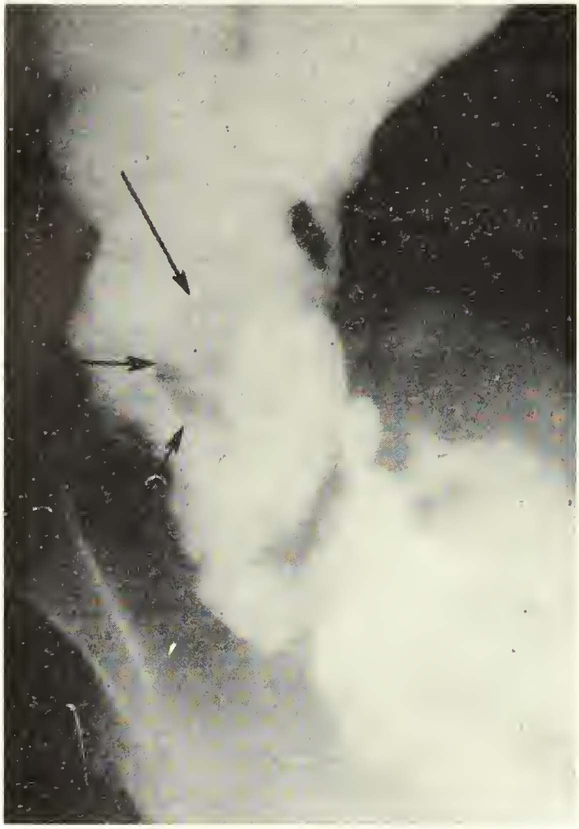

Fig. 6. Case No. 2. Pre-evacuation film. Arrows indicate tumor mass.

Pathological diagnosis: (1) Fistula of the terminal part of the ileum. (2) Simple hyperplasia of the lymph nodes, and (3) Lipoma of the ileocecal valve. (Fig. 6.)

COMMENTS

A preoperative diagnosis of tumor of the ileocecal valve or in that region was not made in this case. Attention had been directed chiefly towards the fistulous tract which was present. On reviewing the X-ray films, however, there was a definite defect noted in the region of the ileocecal valve which was probably caused by the lipoma. As far as can be determined from the history in this case, there were no symptoms referable to the lesion of the ileocecal valve.

SUMMARY

Relatively few cases of lipoma of the ileocecal valve have been reported in medical literature. Two cases of submucous lipoma of the ileocecal valve have been presented. The first patient presented symptoms which were probably due to the tumor. The second case shows no evidence of symptoms referable to the lipoma. When symptoms are present they are probably caused by intussusception, obstruction, or both.

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AMERICAN CANCER SOCIETY MONOGRAPH AVAILABLE

The American Cancer Society announces production of a series of illustrated monographs designed for wide distribution to general practitioners on the early recognition of cancer. These will be in brochure form profusely illustrated in color, and will be written by physicians of highest competence in their specialties.

The American Cancer Society plans to distribute these as widely as possible to physicians of our country in order to bring to mind again value of recognition of cancer by the general practitioner and his responsibility in correct diagnosis and early treatment.

These will be distributed to physicians by the American Cancer Society on a complimentary basis. The Minnesota Division of the American Cancer Society is now preparing a mailing list to receive these brochures. Any physician and surgeon in Minnesota can obtain these brochures as they are produced by writing to: Minnesota Division, American Cancer Society, Inc., 622 Commerce Bldg., St. Paul 1, Minnesota.

Staphylococcic Actinophytosis (Botryomycosis)

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Botryomycosis was first described in the German literature in 1870 as a disease of horses which usually follows castration by rather crude methods. It was characterized by a granulomatous lesion that slowly involved the surrounding tissues but rarely became generalized. In the pus discharged from such lesions the causative organisms occur in small, lobulated, and frequently clubbed granules which were thought to be mycotic in nature and were assigned to the genus Botryomyces. The infection was also reported in other animals.

It was not until 1914 that a report appeared in the French literature that revealed the true nature of these granules. The author, Magrou,[1] corrected the earlier misconceptions and showed that the etiological agent was a Staphylococcus aureus. He found this organism to be identical in all respects to the ordinary strains, but it appeared in the tissues in the form of peculiar granules rather than scattered diffusely throughout the inflamed tissues as in ordinary staphylococcic infections. Magrou showed that these granules were composed of masses of staphylococci which were imbedded in a matrix and surrounded by a membrane. The periphery of the granules were usually covered by closely packed clubs which are so typical of the sulfur granules of actinomycosis.

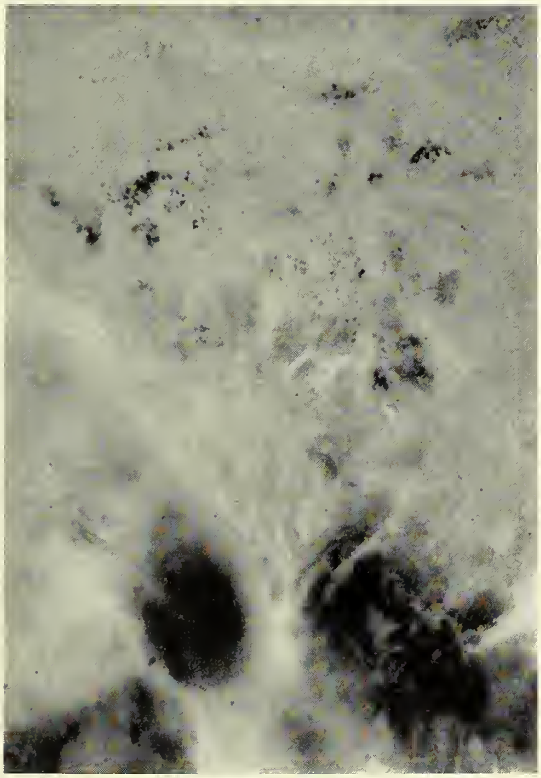

Fig. 1. Botryomycosis, oil immersion magnification, gram stain.

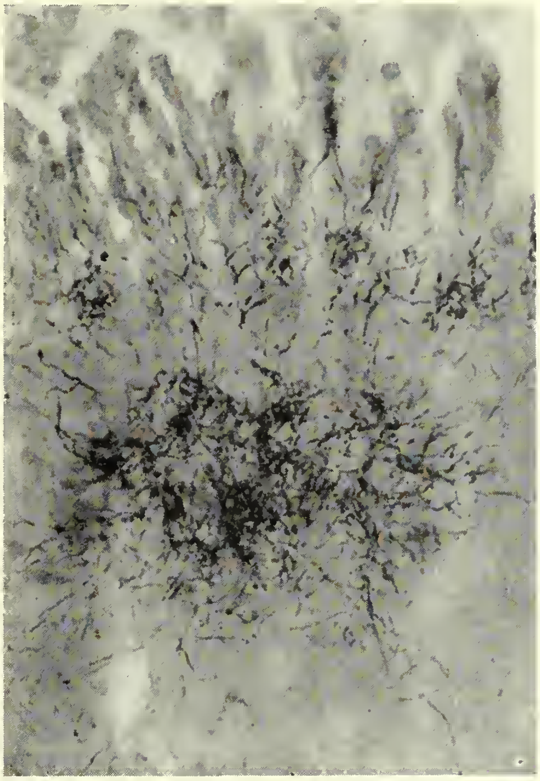

Fig. 2. Actinomycosis, oil immersion magnification, gram stain.

Sections of botryomycosis tissue when stained with hematoxylin and eosin are identical with tissues of actinomycosis stained in a similar manner. It is only when the gram stain is used on these tissues do they become distinguishable. Figures 1 and 2 shows how easily these tissues may be differentiated by the use of gram stain.

Magrou indicated that the lesion in horses usually contained horsehairs as foreign bodies and he was able to reproduce the lesions in the testes of guinea pigs and rabbits by inserting into them horsehairs contaminated with staphylococci. Further work showed that foreign bodies were not necessary but that the lesions could be reproduced in experimental animals by the injection of small numbers of the Staphylococcus aureus. It was necessary to have the numbers within a definite range so that there were too few to produce a purulent inflammation but yet sufficient so that they would not be absorbed with little or no tissue reaction. Once the correct range was established for any strain, the disease could be reproduced at will, both with cultures isolated from botryomycosis cases or with ordinary strains of the Staph-

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Presented as inaugural thesis at the March 1948 meeting of the Minneapolis Academy of Medicine.

ylococcus aureus. Evidently there was a definite balance struck between the invasive power of the bacteria and the defensive ability of the host. It is perfectly obvious that the term "botryomycosis" is a misnomer. In reporting his case in 1936, Berger suggested that this condition be called "staphylococcic actinophytosis."

To date there are ten cases of botryomycosis in the literature. The first four were associated with osteomyelitis.[2] In all of the subsequent cases, the process involved the soft tissues; namely, the female genitalia,[3] the abdominal wall,[4] the intestine in two cases,[5] the liver with abscess formation[6] and the perianal skin.[2] The cases that had the abdominal wall abscess had a broom straw as a foreign body; the two cases of intraperitoneal abscess which involved the bowel had a small fish bone in the center of each. It would appear that this condition in man is very rare indeed, but there can be little doubt that the rarity is more apparent than real. Undoubtedly, there are many chronic inflammatory processes which are in reality botryomycosis and many cases diagnosed as actinomycosis, which, upon further study, would be found not to be that at all.

It is important to differentiate between the two because the prognosis in botryomycosis is so much more favorable than actinomycosis. Simple excision is quite adequate in the former while a more radical procedure is usually required for the satisfactory treatment of the latter.

CASE REPORT

A 35-year-old male gave the history of having had an appendectomy for acute appendicitis seven years prior to his first visit. A short time postoperatively he developed a sinus in his wound which periodically broke down and discharged some purulent material. It then remained closed for a period of months only to break down again. He said various attempts were made to correct the sinus, varying from curettment to cautery. Success attended none of these measures.

Examination revealed a well developed male of 35 with no abnormalities except a draining sinus from an old McBurney incision. There was no B. coli odor to the discharge and a barium enema failed to show a tract leading from the cecum. It became apparent that radical surgery would be necessary to effect a cure. Accordingly, he was explored under spinal anesthesia by Dr. O. J. Campbell. The abdomen was opened through a low right rectus incision. The peritoneum was found to be surprisingly free of adhesions. The old appendiceal stump was free and not connected with the sinus tract. This incision was closed and the tract itself followed downward. It was found to run laterally, but in fairly close proximity with the parietal peritoneum. It buried itself deeply in the right iliacus muscle. The lower end was bulbous and the scar tissue in this region appeared to be somewhat thicker than the superficial parts of the tract. After excision of the tract was completed, the resulting space was obliterated with plain catgut sutures. The postoperative course was entirely uneventful, the wound healed by primary intention, and he was discharged from the hospital on the eighth postoperative day. Since that time he has enjoyed good health and has had no recurrence of his condition. The diagnosis of botryomycosis was made by Dr. F. H. Lott.

CONCLUSION

1. A case of botryomycosis was presented along with a brief review of the literature.

2. On the basis of Magrou's postulation one must conclude that at the time of the original surgery enough staphylococci were deposited in the wound so that they could resist the defense of the host yet were insufficient to produce a typical suppurative reaction.

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AMERICAN COLLEGE OF SURGEONS TO HOLD CLINICAL CONGRESS

The thirty-fourth Clinical Congress of the American College of Surgeons will be held in Los Angeles, from October 18 to 22, 1948. Headquarters will be at the Biltmore Hotel. Dr. Donald G. Tollefson, of Los Angeles, is chairman of the Committee on Arrangements.

Early Diagnosis of Strabismus in Children

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"Doc, Johnny's eye crosses!" How many times have you heard this statement, which is in reality a challenge? If you happen to be the friend who has just dropped in for an evening you may be able to look quizzically at the child and mumble, "Yes, I guess it does," or better still emit a very sagacious "Mmmmm." But, if you are the pediatrician or the family physician and the statement is made in your office, the challenger expects an answer in the form of a conformation or refutation of his diagnosis. It is the purpose of this paper to describe and illustrate how you can give a sound opinion with a minimum amount of time and equipment.

Most parents realize that the child's eyes will wander and deviate in the first three to six months of life and will not be particularly alarmed unless it is marked or constant. Let us then consider at what age the eyes should begin to "track" and when the deviations become important. Chavasse [1] has outlined an excellent chronological table of visual development.

Term: Aimless movements of the eyes which do not exceed physiological demand. Possibly momentary fixation at a strong artificial stimulus, as a bright light.

Two Weeks: Some fixation with an electric light, which is never sustained.

Five to Six Weeks: Stares at massive objects, may hold fixation for a few seconds.

Two Months: Eyes follow person or hand. Binocular fixation is more easily recognizable.

Three Months: Eyes follow moving pencil, head also moves. Reacts to unity, position, distance and size of physiological stimuli.

Four Months: Inspects own hand, reaches for objects, holds head up. Visual acuity at least 6/728 (20/2200).

Six Months: Binocular fixation of objects, for 30 seconds or more. Field of fixation comparable with an adult's but extreme versions not sustained. Visual acuity at least 6/288 (20/900).

Nine Months: Visual acuity 6/72 (20/200).

Twelve Months: Body follows head and eyes to extent of erect posture. Reflexes are prolonged and seemingly accurate. All reflexes are capable of very rapid and complete extinction.

Two Years: Retinal reflexes refined but capable of rapid and complete extinction. Visual acuity 6/12 (20/40).

Three Years: Retinal reflexes becoming grounded, but suffer easily and greatly from disuse. Visual acuity 6/9 (20/30).

Four Years: Extreme versions sustained for several seconds under continuous command. Reflexes grounded to large extent. Disuse causes deterioration but not extinction. Re-use causes rapid recovery of any loss sustained after this age. Visual acuity 6/6 (20/20).

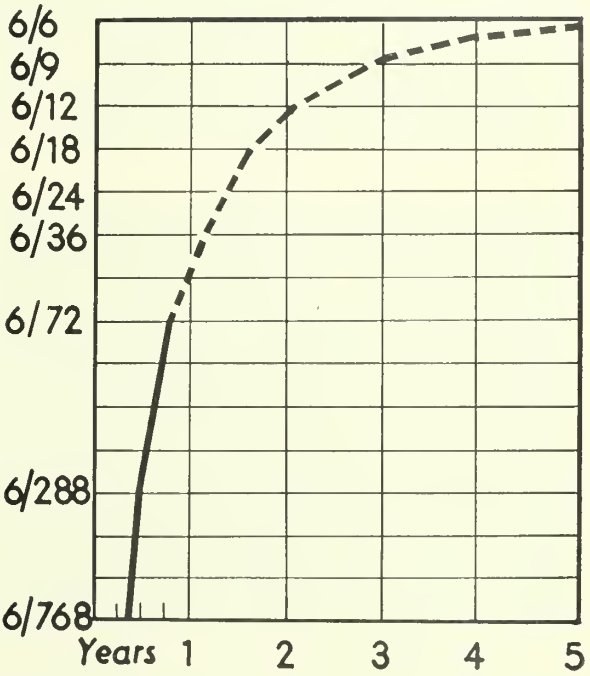

Chart 1.

Five Years: Reflexes assuming unconditional fixity, but still capable of some deterioration from disuse. Visual acuity 6/6 (20/20).

Eight Years: Reflexes unconditionally fixed. Period of flux has ended.

Chart 1 illustrates the increase in visual acuity.

Accordingly, we realize that it is quite normal for the child's eyes to deviate from time to time—up to the age of at least six to eight months. We can then expect some abnormal muscular movements up to the age of one year, but these are only transient in nature. Guibor [2] has outlined very well the differentiation between a physiological deviation and a strabismus in Chart 2.

Let us briefly consider the types of strabismus and the common terms used to describe these. The two main categories are paralytic and nonparalytic, which Prangen [3] describes as follows: The paralytic squint is due to congenital or acquired muscular or innervational anomalies which prevent the eyes from working in unison; the nonparalytic squint is the more common and has for its etiology anything that can prevent binocular vision, such as corneal opacities, fundus lesions, refractive errors, muscle dysfunction and defective fusion sense. Orthophoria is when the visual axes are parallel. A phoria exists when there is a tendency for the eyes to deviate, and a tropia when it is manifest. The prefix

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Presented as inaugural thesis at the April 1948 meeting of the Minneapolis Academy of Medicine.

Chart 2

Differential Diagnosis Between Physiologic Ocular Movements and Abnormal Deviations (Strabismus)

	Physiologic Deviations	*Strabismus*
Age at onset	First 18 months, usually may be present at birth (potential squint)	Noticed after first year but usually present at birth
Duration	Temporary (lasts only a few seconds)	Temporary but progresses gradually; becomes constant over long periods
Monocular or binocular	Both eyes usually affected	Usually monocular
Direction of deviation	Variable (never constant)	Constant, assumes a definite direction. In 83 per cent deviation toward nose.
Predisposing causes	Undeveloped neuromuscular ocular mechanism for maintaining binocular vision	1. Heredity, 2. Hypermetropia, 3. Muscular defects, 4. Asymmetrical retinal images, 5. Fusion defects, 6. Amblyopia, 7. Birth injuries, 8. Anoxemia at birth
Exciting causes	Temporary insufficiency of coordination centers	1. Close work (reading), 2. Infectious diseases
Results	1. Normal vision, 2. Parallel visual axes, 3. Binocular vision, 4. No strabismus	1. Permanent deviation (strabismus), 2. Unilateral amblyopia, 3. Contraction and hypertrophy of muscles associated with relaxation of opposing groups, 4. Absence of binocular vision, 5. Psychologic changes (inferiority complex)

"eso" means that the eye turns in; "exo", it turns out; "hyper", one eye is higher than the other; and "hypo", one eye is lower. When the deviation alternates between the two eyes, it is an alternating squint. The terms squint and strabismus are used interchangeably.

Now, to determine the presence or absence of a squint any diagnostic method should fulfill certain prerequisites, especially if it is to be used routinely by the busy practitioner:

1. It must not require any special equipment.
2. It must require but little time.
3. It must be simple to perform.
4. It must be easily interpreted.

I am going to describe two methods of testing and you will note that all the equipment necessary is a small light and a piece of paper. The light used is called a "Zoo Lite" and has the advantage that the neck is flexible, and it is excellent to hold the attention of the child. It is inexpensive and obtainable at any garage supply house. A pocket flashlight or ophthalmoscope may be used almost as satisfactorily.

The first test to be described is the Hirschberg corneal reflex test. This is best for children up to the age of two years and is well described by Wheeler.[4] A small light is held about 13 inches in front of the child and directly in front of the examiner's nose. In this way one has the child's eyes under direct observation and can see the high light or reflex on the corneae. Normally this reflex will show directly in the center of the cornea, showing that the visual axis is directed straight at the light. Now, if there is a deviation of one eye either medially or laterally, the light reflex will be noted to be on the opposite side of the cornea, that is, if the eye turns in, the reflex will be on the lateral side of the cornea and vice versa. Fig. 1 illustrates a convergent squint.

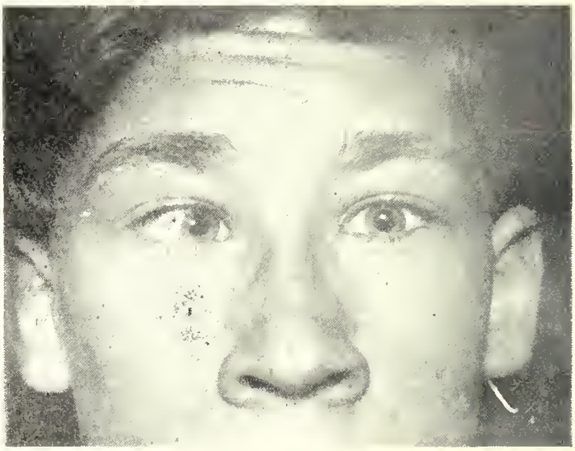

Fig. 1.

The cornea is assumed to have a diameter of 12 millimeters. One-half of that, or 6 millimeters, is the distance from the center of the cornea to the limbus. Each millimeter of deviation is considered equal to about 7 arc degrees. One arc degree is equal to about 2 prism diopters. Consequently, if the light reflex falls about midway from the center of the cornea to the limbus it would show about 3 millimeters of deviation, which would be interpreted as approximately 20 degrees or 40 prism diopters of deviation. If the reflex is out to the limbus, or edge of the cornea, it would show about 45 arc degrees. With a little practice one can estimate quite accurately the amount of the deviation. The light is then moved into the four corners, namely, up and right, up and left, down and right, down and left, to see if there is any limitation of motion of either eye when rotated in these directions. The upper lids are retracted when the downward gaze is studied to enable a better view of the corneal reflex. The light is then brought toward the patient's nose to test his power of convergence. (Figs. 2, 3, 4, 5, 6.)

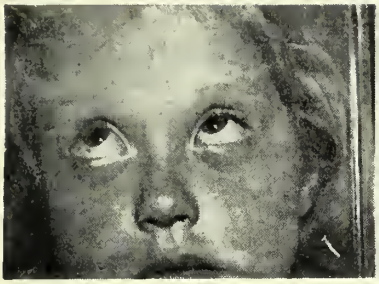

Fig. 2.

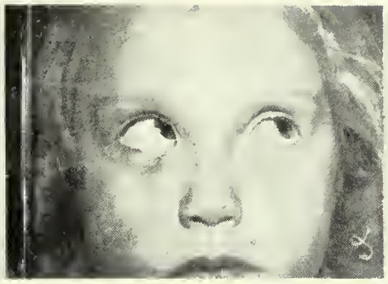

Fig. 3.

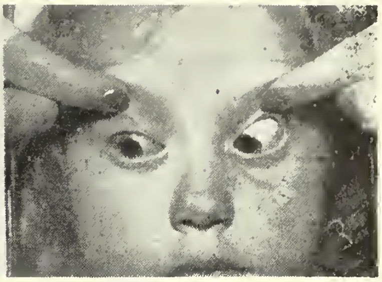

Fig. 4.

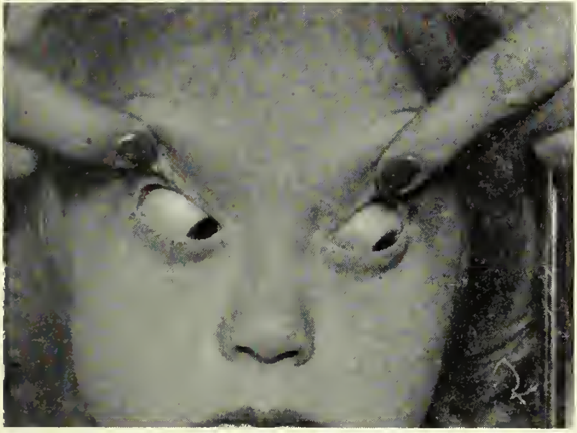

Fig. 5.

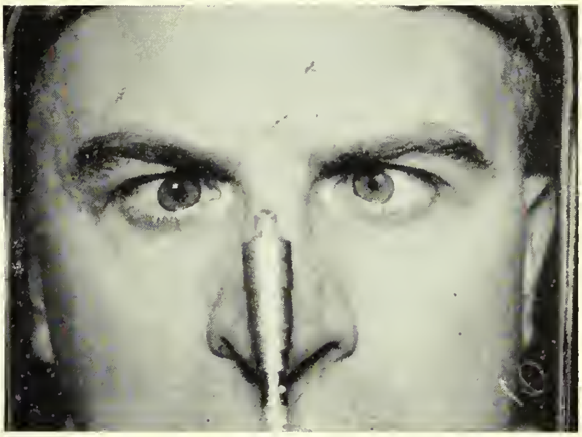

Fig. 6.

The second test to be described is the screen or cover test, which has been greatly popularized by the late James Watson White. The equipment mentioned previously is all that is necessary, but the cooperation of the child is needed. In many children little more than two years old, this test can be satisfactorily performed, although accurate measurements may be difficult or impossible. Inasmuch as you are not concerned primarily with the exact amount of deviation but only *if* the eye deviates, I feel this test is extremely valuable.

White[5] suggests that this test be done in the following manner. The patient is seated before the examiner in such a position that the patient can look past him and yet give the examiner a chance to look almost directly at his eyes. The child then fixes a distant object such as a light or doorknob. Such an object will not hold the attention of the very young, and the test may then be done by holding the light in front of the examiner about 13 inches from the patient. When checking the position of the eyes in straight forward gaze, the method of examination and interpretation is essentially the same unless accurate measurements are required. The cover, which is the small piece of paper previously illustrated, is held over one eye (Fig. 7). The position of the covered and uncovered eye is noted and the paper is then removed. The same procedure is done on the opposite eye, covering and uncovering. If the light reflex is in the center of the pupil and there is no movement of either eye, one can assume that the vision is essentially the same in each eye. If one eye has better vision, that eye will pick up the fixation as soon as it is uncovered. The other eye may then be assumed to have poorer vision and may be an early amblyopia. This test determines the fixing and non-fixing eye.

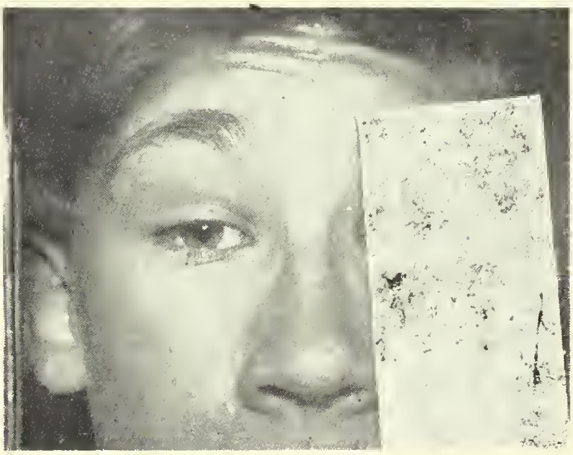

Fig. 7.

The cover is now moved from one eye to the other just fast enough to allow the exposed eye to pick up fixation, which is about 2 or 3 seconds. Again the position of each eye must be noted and watched. If there is a tendency for the eyes to cross, the exposed eye will be directed right at the light and the covered eye will turn toward the nose. When the cover is shifted to the

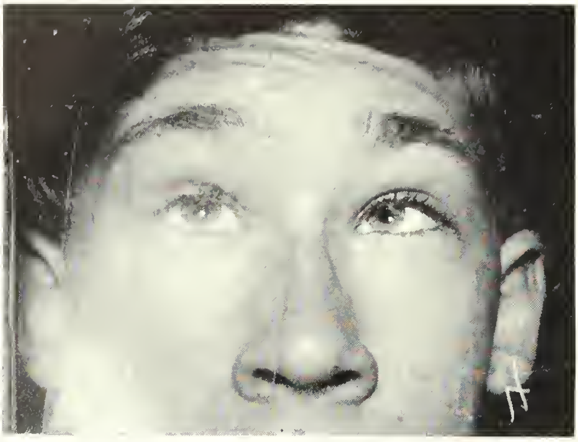

Fig. 8.

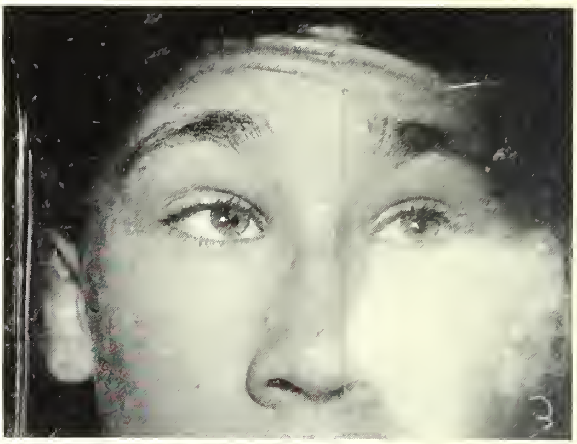

Fig. 9.

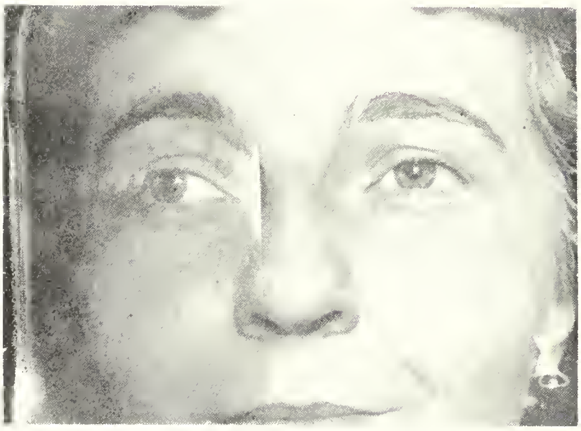

Fig. 10.

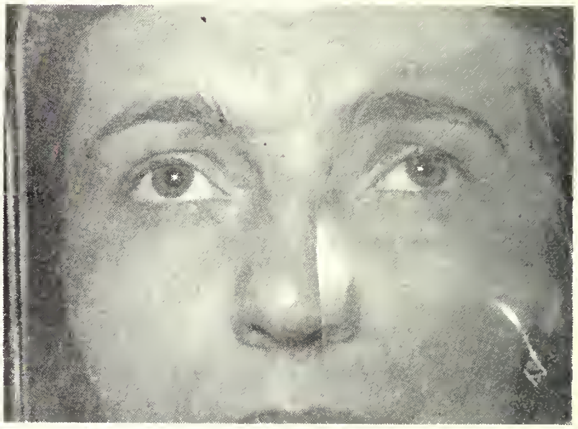

Fig. 11.

other eye the recently deviating eye will swing out to the mid-line and pick up fixation, while the now covered eye will deviate in toward the nose. The amount of the phoria or tropia will determine the amount of the deviation of the eye, or the strabismus. The same occurs if there is a divergence except that the covered eye will turn out, and will swing in to the mid-line to pick up fixation.

A transparent cover is used to show what happens to the covered eye. Figs. 8 and 9 show the deviation of the covered eye toward the nose in a convergent squint. Figs. 10 and 11 show the deviation away from the nose in a divergent squint.

The light is then carried into each of the four corners, as previously described, and the cover test applied. For example, the light is held up and to the right of the patient in such a way that each eye can see it. The eyes are then alternately covered and the movements observed. In this way any vertical deviation due to paralysis or paresis of a muscle can be demonstrated. We know from Herring's law that an equal stimulus goes to each of the yoke or synergistic muscles of the eyes. If one muscle is weak or paretic, a stronger stimulus will be given to carry out the desired motion. This added impulse will also be received by the yoke muscle, which will result in an overaction of that muscle and a greater excursion of motion. For example, in looking down and to the left, the left eye is carried down by the left inferior rectus and the right eye by the right superior oblique. If the left inferior rectus were paretic a stronger stimulus would go to this muscle and also to the right superior oblique which, it being normal, would result in an overaction or "overshoot" of the right superior oblique. This would cause the corneal reflex to be higher on the globe of the right eye than the left.

From the description of this test one realizes that it is the movement of the eye when covered or uncovered which determines the presence or absence of strabismus. Small deviations are common in adults, but I believe that any child who shows a deviation should have the benefit of further study.

What is the most common pitfall in the diagnosis of squint by the inexperienced? I believe it to be the pseudo-strabismus caused by the epicanthal fold. Fuchs[6] describes this as a fold of skin which juts out on both sides of the dorsum of the nose and projects over the inner angle of the eye so as to partly cover it. This fold of skin is present in a good percentage of infants and tends to disappear as the dorsum of the nose grows, at which time the nasal bones elevate this skin much as a ridgepole does a tent. However, while the fold is present it covers up the medial portion of the globe,

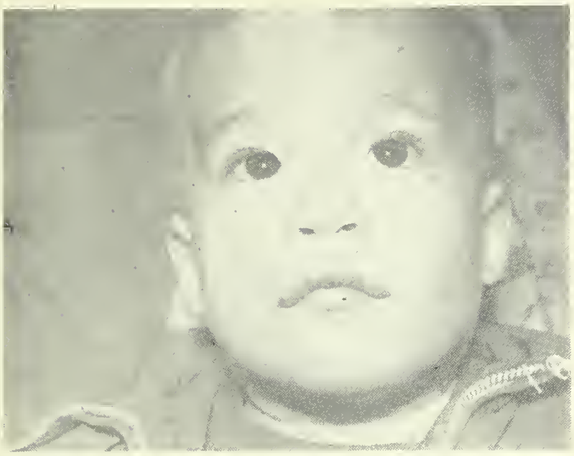

Fig. 12.

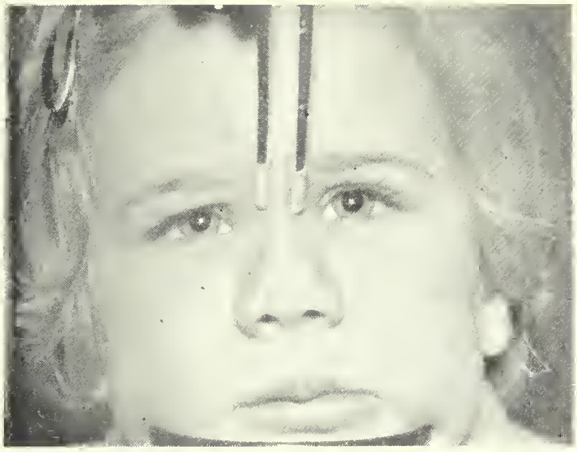

Fig. 13.

especially on rotation medially. This gives the illusion that the eye turns in more than it should and hence the false diagnosis of squint. Pictures do not illustrate it as well as when observed directly, but Fig. 12 may convey the idea. Now, by using your fingers or a broad forcep to pinch up the fold of skin, you will note that the illusion is destroyed (Fig. 13). This test is just as simple as the others and will save an erroneous diagnosis in a good many cases.

We now wish to know if the child should be referred for further study. I think any of these criteria warrant referral.

1. If there is any deviation of the eyes that is at all constant.
2. If there is a deviation elicited by the Hirschberg corneal reflex test.
3. If there is any movement of the eyes with the screen or cover test.
4. If there is consistently a fixing and a non-fixing eye, as demonstrated by the cover test.
5. If lack of rotation in any portion of the fields is elicited by the cover test.
6. If the reflex from your light on the cornea of the uncovered eye is not in the center of the pupil. This may indicate a paralysis of a muscle, or a marked amblyopia which is often accompanied by abnormal retinal correspondence.

In conclusion, I have outlined the early development of vision and fixation and shown that we can expect some deviation from parallelism of the two eyes up to the age of one year. Two very simple tests have been described and illustrated, namely the Hirschberg corneal reflex test, and the screen or cover test. A common pitfall in the diagnosis due to an epicanthal fold has been described. Certain criteria warranting referral for further study have been outlined. If these few points are kept in mind and these simple tests performed, you need not procrastinate when confronted with the challenge, "Doc, Johnny's eye crosses!"

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MINNEAPOLIS HOSPITAL OPENS OCCUPATIONAL THERAPY DEPARTMENT

A department of occupational therapy has been opened at St. Mary's Hospital, Minneapolis, Minnesota, for patients requiring manual exercise or mental hygiene therapy. The emphasis at present is on treatments which will improve the patient, rather than on the products. Weaving of various types, printing, and leather work are available. The teaching staff consists of supervised senior students from the occupational therapy department at the College of St. Catherine. As the need arises, more staff members will be added.—

Hospital Progress, July, 1948.

Conditions Simulating the Roentgen Appearance of Intestinal Obstruction

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THE value of the roentgen findings in the diagnosis of acute abdominal conditions has been recognized and accepted for years. So important have the findings become that seldom does a case with suspected acute abdominal pathology come to surgery without recourse to a preliminary plain film of the abdomen, if this is available. Certain roentgen diagnostic criteria have been firmly established, and when definitely present, are pathognomonic. Everyone knows the meaning of the presence of free gas in the abdominal cavity and interprets this finding as due to rupture of a hollow gas-containing viscus. We have also learned, however, that the absence of such a sign does not rule out perforation.

Other findings are not as absolute, but are, nevertheless, of extreme importance, first in arriving at a correct diagnosis when correlated with the clinical picture and other laboratory findings, and, second, in determining the choice of therapeutic procedure.

The amount of gas within the various divisions of the intestinal tract of a normal individual, and the pattern it presents on the X-ray film of the abdomen, is quite well recognized; so that any substantial increase in the amount of gas or change of distribution pattern is considered abnormal and of clinical significance. The distended stomach is ordinarily easily recognized, as is the duodenum. The jejunum, when abnormally distended, gives a feathery appearance which is quite typical, whereas the ileum gives a somewhat smoother bland outline and is usually easily distinguished as such. The distended colon is, as a rule, quite readily recognized by the haustral markings. In certain instances, one finds it almost impossible to determine from the plain film of the abdomen whether he is dealing with distended small bowel or colon; usually this differentiation is not difficult. Distended loops of small intestine are centrally located and are grouped in a step-ladder arrangement horizontally across the abdomen, and sometimes vertically side by side. The distended colon is usually located at the lateral margins of the abdomen and the degree of distention is generally greater than in the small intestine.

It has been stated, and rightly so, that if the gaseous distention of the bowel is limited to the small intestine, one is typically dealing with mechanical obstruction of the small intestine; if the distention involves the colon only, mechanical obstruction of the large bowel is present; if both the colon and small intestine are distended, paralytic ileus prevails. From the previous description it might be inferred that mechanical obstruction of the bowel causes gas distention which, on the roentgen film, presents a typical appearance. If this were 100 per cent true, our diagnostic problems would be greatly simplified in the determination of the presence or absence of intestinal obstruction. Unfortunately, many cases of mechanical obstruction present such variable findings, and bowel distentions from other causes so closely simulate the findings obtained in obstruction, that differentiation is often impossible by means of the roentgen findings alone.

In the main, there are two conditions which frequently simulate the roentgen appearance of intestinal obstruction, namely, paralytic ileus and spastic ileus.

PARALYTIC ILEUS

Paralytic, or adynamic, ileus is much more common than the spastic, or dynamic, type. It is caused by a variety of conditions, most commonly peritonitis. External abdominal injuries, spinal injuries, ureteral colic, less commonly biliary colic, torsion of ovarian cyst pedicles, kidney infections, and other infections, such as pneumonia, to name a few, all may be causative factors in the development of paralytic ileus. The pattern of certain portions of distended bowel, as previously stated, is more or less typical, but this appearance does not absolutely differentiate between mechanical obstruction and adynamic ileus. Both the small and large bowel are ordinarily distended in paralytic ileus, but either one alone may be involved. In mechanical obstruction of the colon, we sometimes see distention of the small bowel as well as the colon, due to incompetence of the ileocecal valve. Also, in marked distention of the bowel in paralytic ileus, one cannot always be certain from a plain film whether large or small bowel or both are involved, and occasionally it is difficult to differentiate the appearance between colon and jejunum.

As a rule, in paralytic ileus the distention of the bowel is quite prominent and over a considerable length of the gut; but in a few instances only a few coils of small intestine, or even one, are involved. This same appearance is not uncommon in strangulating obstructions. A particularly disturbing picture is that of distention limited to the small intestine, with the coils in a step-ladder arrangement, in a postoperative case complicated by peritonitis.

In occasional instances the clinical picture is as difficult to evaluate as the roentgen findings, and a differential diagnosis between mechanical, paralytic and spastic ileus, even after correlation of all the clinical and laboratory findings, may be impossible to make.

SPASTIC ILEUS

Spastic ileus, as mentioned previously, is much less commonly encountered than paralytic distention, and the cause is often unknown. It may be due to external in-

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Inaugural thesis presented at the Minneapolis Academy of Medicine meeting, December 15, 1947.

juries or to foreign bodies in the lumen of the bowel. In this type of ileus the distention most frequently concerns the colon, and the clinical picture may so closely simulate that of mechanical obstruction that differentiation may be impossible; in fact, some writers feel that there is no way one can be certain of the diagnosis without recourse to surgery. It is probable that some cases of intestinal obstruction which responded favorably to non-operative measures may have been actually spastic in origin. It has been observed that spastic contractions have relaxed apparently due to manipulations incident to laparotomy, and it seems probable that spasm sometimes yields to narcosis.

Most functional disturbances of the bowel following abdominal surgery have been considered paralytic in nature; however, true spastic conditions are encountered, and in this particular occurrence of spasm of the intestine we wish to mention the work being carried out by Dr. Carl O. Rice and Dr. J. H. Strickler which is shortly to be published under the title "Segmental Spasm as a Concept of Postoperative Gas Pains: Its Release by Benzedrine Sulfate." They attempted to differentiate the type of pain resulting from intestinal distention in postoperative patients and to correlate the roentgen findings. Some patients complained of abdominal distress but not actual pain, while others described true intestinal colic. In those cases without colic a uniform distribution of intestinal gas was seen on the X-ray film, most commonly located in and distending the colon and lower small intestine.

In the majority of those patients with gas-pain colic, however, a spastic area of the bowel was seen, proximal to which the gut was distended and distal to which the bowel appeared to be collapsed or contained very small and insignificant collections of gas. The area of spasm, or so-called "trigger zone," was most often encountered in the proximal descending colon just beyond the splenic flexure. This area is commonly recognized by roentgenologists as one of the points of origin of waves of contraction, or "pacemakers," in the normal colon which are frequently seen during the barium enema examination. Other "pacemakers" are visualized near the hepatic flexure and in the lower sigmoid.

The patients presenting colic and spasm were given 10 mg. of benzedrine sulfate intravenously, and this brought about a rapid release of symptoms. A follow-up film of the abdomen demonstrated relaxation of the spasm and redistribution of gas into the previously empty distal bowel. In one case the small intestine only was distended and presented the typical findings seen in mechanical obstruction; in fact, the clinical findings were such that mechanical obstruction was very seriously considered. Gas-pain colic disappeared in 4½ minutes after intravenous administration of benzedrine sulfate and the patient had no further difficulty.

Summary and Conclusions

1. The roentgen findings of intestinal distention due to mechanical obstruction can be simulated in practically every instance by distention resulting from paralytic and spastic ileus.

2. In most cases, differentiation between a mechanical obstruction and a paralytic or spastic ileus is impossible by means of the roentgen findings alone.

3. Spastic ileus is not infrequently encountered during convalescence following abdominal surgery.

HEART INSTITUTE APPROVED

In approving legislation setting up a National Heart Institute, the 80th Congress manifested a forthright attitude to the mounting incidence of cardiac illnesses. It is known, of course, that heart disease in its widest implications, is now the Number One Killer. It has outclassed all the infectious diseases, tuberculosis and cancer. In fact, it is now the most pressing, the most ominous health problem confronting the American people.

More intensive research into its causes, treatment, alleviation, hygiene, rehabilitation, not to mention other equally vital matters, is sorely needed.

The establishment of the National Heart Institute will, in all likelihood, become the most constructive force in the research and management of heart cases, and thus make a most gratifying contribution to the morale, treatment and living routine of cardiac patients.

—*Drug Trade News*, July 12, 1948.

Total Abdominal Hysterectomy

An Analysis of 250 Consecutive Operations without a Mortality

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The author does not intend to create an argument over the relative merits of total and subtotal hysterectomy, but he believes that most of the hazards usually associated with total resection may be met by a surgical technique which leaves almost no broad ligament veins, removes existing infection, and peels the cervix entirely from the vagina without shortening. It will be evident that the writer does prefer the total over the subtotal operation even in benign conditions in the majority of cases.

All vaginal hysterectomies have been excluded from the series because such cases differ as to both indications and technique.

It is often said that the "occasional operator" should not attempt the total procedure because of the increased mortality rate. Let it be said here that the operator would certainly have been classed as an occasional operator for many years. During this time it is true that only the easier cases were chosen for total removal, but even then over 50 per cent of these early cases were totally performed, even those in many small community hospitals where physical equipment and anesthesia often were real problems.

One of the arguments frequently advanced for total instead of subtotal hysterectomy is the possibility of the later development of carcinoma of the cervical stump. Because of this consideration some authors can find no justification for leaving a nonfunctioning cervix *in situ* if it can be removed without unduly prolonging the operation or the hazard. Actually, it is difficult to establish statistical proof that the incidence of cancer developing in the cervix is great enough to favor total over partial hysterectomy. Few words will be spent on this age-old controversy except to review the circumstances under which these cases were performed.

However, in this group of 250 total hysterectomies there was one unsuspected nonclinical carcinoma of the cervix. This was discovered when a corpus was removed because of adenomyosis. Here is one case of cervical cancer which undoubtedly would have become clinical sometime later if a subtotal operation had been chosen. Moreover, the author has observed as many as three carcinomas of cervical stumps within the period of a year. Councellor states that it is reasonable to expect carcinomas to appear in 2 per cent of all cervices after subtotal hysterectomy. Given found the high incidence of 3.8 per cent of carcinomas of the cervical stump in a series of 214 cases of cancer of the cervix. Benign tumors of the cervix are extremely rare and need not be considered in this connection.

No more time will be spent on this subject because the danger of carcinoma developing in the remaining cervix is far from the only reason for its removal.

The most common complication arising from a cervix is infection. If this organ is diseased, its mere elimination as a persistent cause of excessive discharge would probably justify excision, not to mention the eradication of a definite focus of infection. Certain seemingly unrelated conditions have been directly traced to chronic cervicitis.

For instance, many cases of persistent and annoying cystitis have as focus an infected cervix with lymphatic drainage along the base of the bladder. Some types of iritis or Huhner's ulcers may be definitely related to an infected cervix, the removal of which has been known to bring remarkable cures in such eye conditions. Also to be kept in mind is the possible relationship of arthritis, neuritis, etc., to chronic cervicitis.

Cautery to the infected cervix, though a fairly successful procedure, runs a poor second to complete elimination of the offending organ. The cautery methods may be quite satisfactory in destroying many of the diseased glands, but a post-cauterized cervix which appears and feels perfectly healthy may harbor deeply imbedded infected cysts.

Prolapse of the vagina has said to be more frequent after total than subtotal hysterectomy. For this reason some authors recommend leaving the cervix in place as a vaginal support. However, this observation was not borne out in the 250 cases of the series under discussion. In the entire group there was not one known case of vaginal prolapse.

On the other hand, in the subtotal group, which constituted about one-fourth the number of those who underwent total hysterectomy, there were three cases of prolapse. It is true that most of the total hysterectomies were performed within the last seven years and that not as much time for observation has elapsed, but prolapse is most frequent within the first six months after operation.

Pulmonary embolism was not found in any of the total hysterectomy cases. In two cases, or 0.8 per cent, thrombophlebitis of the lower extremities occurred and delayed convalescence. You will agree that this incidence is no greater than with any type of laparotomy. However, in the subtotal group there were three cases of thrombophlebitis in the lower extremities. One of the patients died of pulmonary embolism. This remarkable difference in occurrence may be attributed to the operative technique which left practically no broad ligament veins behind to become thrombosed. Moreover, no focus of infection or infected cervix remained to contaminate

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the newly operated pelvic area.

Other complications among the total hysterectomy group included three cases of bronchopneumonia; one followed an immediate postoperative atelectasis, the two others went through a typical course of bronchopneumonia.

Postoperative bleeding of the everted vaginal cuff necessitated suturing in four cases. With two, the hemorrhage was severe enough to require transfusion. This complication, of course, can not appear with the subtotal operation.

Urinary infection is more apt to appear with total hysterectomy than when less dissection of the bladder is necessary. Trauma to the bladder itself and disturbance of the sympathetic nerve fibers caused by the greater dissection is the reason for more catheterizations. The frequency of urinary infection will just about parallel that of catheterization. No known injury to the ureter occurred in any of the 250 cases. There were 25 cases of pyuria, all of which responded to ordinary therapeutic measures and did not seriously affect the recovery in any case.

No cases of generalized peritonitis were observed.

The average stay in the hospital was ten days when no pelvic repair was associated with the abdominal surgery.

The average temperature reaction was 100.8° F.

The average time for anesthesia was one hour and twenty minutes when no pelvic repair took place.

General anesthesia was the usual choice. In specially indicated cases, local abdominal block or spinal anesthesia was used.

Technique (for benign indications)

A safe anesthetic and then adequate exposure is important for good surgery. No preliminary douches are given. The vaginal tract is cleansed thoroughly with tincture of merthiolate and the bladder is catheterized while the patient is on the operating table. The usual low midline incision is made, but is extended to the left and well above the umbilicus. Two Kocher hemostats are placed on the round ligament.

The ligament is then separated between the two forceps and the anterior and posterior layers of the peritoneum are cut about two inches. The anterior incision is then carried forward to the anterior wall of the uterus, near but slightly above the vesico-uterine fold. This fold is separated as high as it will easily separate without bleeding. Dissection is carried to the midline where the vesico-uterine ligament is situated. The fimbriated end of the tube is next grasped and help up to the light.

If the ovary is to be preserved on this side, the vessels are clamped close to the tube. The utero-ovarian ligament is next severed between two clamps. The ovarian end is tied securely with a heavy tie. The portion of the broad ligament between the anterior and posterior layers is cleaned of all vessels bluntly down to the base containing the uterine vessels and cardinal ligament. If the ovary is to be removed, the infundibulo- the tube and ovary and saving the mesosalpinx steps pelvic ligament is clamped, separated, and tied, taking when taking the tube. The uterine vessels and cardinal ligament at the base of the broad ligament are then clamped with three Kocher forceps. Cutting takes place between the medial two for safety. Care is exercised here to place these forceps at about the level of the internal os and as close to right angles to the uterus as possible. If this is carefully done, it is not necessary to isolate the ureters.

A similar procedure is carried out on the other side. Both tubes are always taken unless they have been removed at some previous operation. One ovary is left, preferably the right if both are normal.

When both sides have been dissected, firm traction is necessary to "peel" the cervix out of the vagina, leaving the utero-sacral ligaments intact posteriorly. Two small gauze squares soaked in tincture of merthiolate are inserted into the vagina as soon as the vagina is opened. The peeling maneuver is done best by snipping small pieces of tissue at the level of the vaginal attachment to the cervix, during which time there must be firm traction. At this stage, if the peeling is accurate, there will be no shortening of the vagina nor will any of the cervix be left in the vagina. Undermining the mucosa at this point inevitably leads to bleeding that is difficult to control.

After the specimen is removed, the assistant is cautioned to keep the vaginal cuff retracted upward carefully so as to avoid any contamination of the cul-de-sac with vaginal contents. An inverting mattress suture is used to close the vagina. Care is taken here not to penetrate the vaginal vault with the suture.

The uterine vessels and cardinal ligaments are ligated with a stick tie which actually penetrates the lateral wall of the vagina. If this is placed accurately, it is impossible to catch a ureter and, likewise, the suture is below the entrance of the uterine vessels so that development of a hematoma is avoided. The round ligaments are transfixed to the vaginal cuff. Peritonealization is the same as for other hysterectomies although care is always exercised not to suture an ovary to the vaginal cuff where it may become subsequently painful to the patient; rather, it is always supported from the lateral wall. It must be remembered before closing that the greatest danger of pelvic surgery is an adherent small bowel and its subsequent seriousness. Careful peritonealization is extremely important. If it is impossible, as in an old pelvic inflammatory process where extensive dissection takes place, one may obliterate the cul-de-sac with the utero-sacral ligaments or at least utilize the sigmoid colon to cover up raw surfaces.

Drainage was carried out in only one case. It is preferable not to drain any hysterectomy. The pelvic peritoneum will tolerate terrific insults even from old abscesses that accidentally rupture during removal. Drainage, either abdominally or vaginally, only adds to the morbidity and development of more abdominal adhesions.

The appendix is always removed.

There is no special postoperative care other than the removal of the vaginal gauze in forty-eight hours.

Prostigmine is never used. Enemas are given about the third day, but never until the patient has expelled flatus spontaneously.

SUMMARY

Number of cases	250
Average age	44
Youngest	15
Oldest	73

INDICATIONS

Myoma	62.0%
Endometriosis and adenomyosis	16.6%
Fibrosis	2.0%
P. I. D.	9.5%
Recurrent cystic hyperplasia of endometrium	5.3%
Cervical stenosis, recurrent	.5%
Normal	1 case
Ovarian malignancy	2.0%
Uterine malignancy—cervix	2.0%
Uterine malignancy—fundus	6.0%
Sarcoma	1.0%

After reviewing the above cases, one is justified in stating that complete removal of the uterus should be attempted even by the occasional operator in selected cases. It is reasonable, too, to advise removal of the total uterus to avoid benign conditions such as infection. It is difficult to statistically prove the problem of development of cancer in a cervical stump. From this series it is the definite opinion of the writer that any teaching service should subject the new men to the total technique.

This paper is too short to go into the sexual and psychiatric problems associated with hysterectomy; these are no different in the total than in the sub-total group.

Book Reviews

Allergy in Theory and Practice, by ROBERT A. COOKE, M.D., Sc.D., F.A.C.P., Attending Physician and Director of the Department of Allergy, the Roosevelt Hospital, New York City. 572 pages, with 43 illustrations. Philadelphia and London: W. B. Saunders Company, 1947; $8.00.

After thirty years of leadership in allergy, Dr. Robert A. Cooke has published his first book on the subject.

This book is an outgrowth of the short course in allergy sponsored by the American College of Physicians in recent years. It is written largely by Dr. Cooke himself with contributions by his co-workers of the "New York Group."

Dr. Cooke has not only been an authority, but one of the earliest workers in clinical allergy. It is noteworthy that this is his first attempt at writing a book. It has been eagerly awaited for a number of years by all interested in allergy.

The book is divided into nine sections, comprising thirty-five chapters. Chapters on the pathologic-anatomic aspects of allergy and the immuno-chemistry of antigens and antibodies are included. Few books on allergy have presented these basic fundamental principles. The individual chapters are complete for the subject matter, are brief and to the point, with relevant case histories wherever possible.

Dr. Cooke's present conception of the etiology of infantile eczema is contrary to the existing thought which has prevailed in allergy for many years. To students of allergy, it is revolutionary in thought, yet stimulative.

It is of special interest to note Dr. Cooke's interest in the field of bacterial allergy and the role of importance he gives it. This has long been both a controversial and a neglected phase of clinical allergy to which little importance has been attached.

This book is recommended not only for the allergy specialist, but also for the general practitioner interested in allergy. It is written simply, directly and in a practical manner. An abundance of irrelevant matter which is so often seen, is totally lacking. It is a worthwhile contribution to the accumulating literature in allergy.

W. E.

Atlas of Cardiovascular Disease, by IRVING J. TREIGER, M.D. St. Louis: The C. V. Mosby Co., 1947. 244 illustrations, 180 pages, $10.00.

In this work the author presents various cases of heart disease, showing the characteristic changes in the roentgenogram, electrocardiogram, and pathological specimens, with special emphasis on their clinical values.

The atlas is divided into six parts: Normal Heart, Rheumatic Heart Disease, Arteriosclerotic Heart Disease, Hypertension, Syphilitic Heart Disease, and Congenital Anomalies.

The illustrations, as a whole, are well-selected and many of the pathological specimens are in color. The correlation of the roentgenograms, electrocardiograms and autopsy findings in each case helps materially in the interpretation of the findings.

The book should be of much value to all physicians in the management of new cardiovascular cases.

T.Z.

Internal Medicine in General Practice, by ROBERT P. McCOMBS, M.D. Second edition; 741 pages with 122 illustrations. Philadelphia: W. B. Saunders Co., 1947. $8.00.

Dr. McCombs, Director of Postgraduate Teaching at Tufts College Medical School, has almost completely rewritten this volume for the second edition. Like its predecessor, it has been written around the more frequent problems of general practice and aims to answer the questions on which the family physician most often seeks advice. The book is, of course, founded on an unusually wide experience in postgraduate teaching but the author carefully avoids any tendency to delve into matters that are strictly within the province of the specialist. Special emphasis is placed on those diseases in which errors in diagnosis and therapy commonly occur; physiologic principles have been integrated with the clinical aspects of the disease. Special treatment is given the chapters on therapeutics. The book can be recommended for the clinician looking for a text that is in full accord with the latest in clinical medicine.

J. N.

The Diagnosis and Treatment of Bronchial Asthma, by LESLIE N. GAY, M.D. Baltimore: The Williams & Wilkins Company, 1946. Pp. 334, illustrated. $5.00.

This book concerns a disease in which every student and physician is interested. In spite of the enormous amount of clinical and laboratory research which has been reported, the diagnosis and treatment of asthma still is a difficult problem. The author has tried to combine his experiences of many years together with those of other investigators into a monograph which should be of great help to the practicing physician.

The material is presented in seven chapters which deal with the physiology of normal respiration and the asthmatic state, the etiology, the pathology, and the diagnosis of bronchial asthma, the complications and differential diagnosis of bronchial asthma, the asthmatic paroxysms due to psychosomatic disturbances, and finally the treatment of asthma. The subject matter is well supported by illustrations, tables and case reports. There may be too many of these reports and they may be too long. The author may have placed too much emphasis on the value of his personal investigation. Nevertheless, there is plenty of good in this book and the monograph is highly recommended.

A. V. S.

Sclerosing, Non-Suppurative Osteomyelitis

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History

This unusual and interesting form of non-specific infection of bone was first described by Gosselin[5] in a thesis in 1868 according to a review of the literature by S. F. Jones[5] in 1921. Kuppel[5] in 1879 reported a case of non-suppurative osteomyelitis in a boy of 12 years following a traumatism to the right thigh. Cheyne[1] in 1890 reported a case involving a radius. In 1891 Garré,[2] to whose name this disease is now associated as Garrés osteomyelitis, gave his classic description of the disease, presenting 20 cases observed in the Tubingen Clinic.

The rarity of the disease is evidenced by its infrequent appearance in literature and the limited number of cases reported. It occurred in 20 of 559 cases of osteomyelitis or 3.6 per cent in the Tubingen Clinic. In a series of 1,299 cases of osteomyelitis reported by Trendel[13] in 1903-1904 it was found in 54 cases or 4.2 per cent. In 1924 Henderson[3] reported 30 cases or 1.5 per cent in a group of 1,968 cases of osteomyelitis and in 1945 Meyerding[9] reported 80 cases or 2 per cent in 4,000 from Mayo Clinic.

Klemm[7] describes four groups or types of sclerosing osteomyelitis, namely: 1) Without suppuration or necrosis. 2) With suppuration. 3) With necrosis. 4) With cicatricial thickening of the periosteum and soft parts and "brain-like" deposits in the scar.

The most constant symptoms and physical findings of the disease are pain, tenderness, and a hard bony enlargement along the shaft of a long bone. The pain, usually of a dull aching character, is the first sign to appear. It is aggravated by activity and is worse at the end of the day and at night. Tenderness over an area of the painful extremity is next noted. As a rule, medical advice is not sought until sometime after the onset of the disease. Usually the symptoms have been present for weeks or months before the physician has been consulted. The hard bony tumor or enlargement along the shaft of a long bone is usually present when the patient first presents himself for examination. The tibia and femur are the most frequently involved bones although cases have been reported involving the radius, ulna, fibula and metacarpals. In 1935 Murphy[10] described a case involving the clavicle.

Various other factors have been presented in describing this disease but none are constant enough to make them differential in its diagnosis.

Traumatism has been described as a precipitating factor, as have acute infectious diseases such as pneumonia, influenza, and typhoid. Focal infections of the teeth and tonsils have been offered as a source of the original infection. Occasionally the onset is acute with high fever, systemic reaction, and leukocytosis. It occurs in males slightly more frequently than in females. It is most common under the age of 30 years although cases have been reported over the age of 50.

The differential diagnosis of the condition is difficult in the great majority of the cases, and especially in the earlier stages of the disease. It is most frequently confused with malignant bone tumors and syphilis. Early in its course the disease may be confused with endotheliomyeloma of Ewing and with osteogenic sarcoma, especially the sclerosing type. The fact that it occurs in the diaphysis of long bones helps distinguish it from the sarcoma which begins most frequently in the ends of the long bones. However, Ewing's endotheliomyeloma with its involvement of the diaphysis, its pain, fever, leukocytosis, its amassing of layers of new bone, and its bony destruction presents a picture so similar to this disease that differentiation early in the course of the disease is very difficult. A biopsy is often necessary to establish the diagnosis, although a course of deep X-ray therapy may help distinguish the diseases by the marked response of Ewing's sarcoma to radiation. Later in its course the disease must be distinguished from syphilis, tuberculosis, Paget's disease (osteitis deformans), osteitis fibrosa cystica, traumatic subperiosteal ossifying hematoma, myositis ossificans, and metastatic carcinoma. These differentiations are aided by serological tests, blood chemistry studies and serial roentgenogram studies of the involved bone and other bones of the skeleton.

The pathology of the disease is one of bone necrosis and destruction, granulomatous tissue formation with absorption of the destroyed bone without sequestration or suppuration, and bone formation with replacement of the involved shaft, progressing to a sclerosis of the bone and a remaining enlargement with an encroachment on the medullary cavity. Cases of sequestration have been reported, as have localized areas of suppuration. Staphylococcus aureus has been cultured most frequently from the involved bone although at times no growth has been obtained.

The treatment of the disease in the past has been the gutting or the removal of a portion of the involved bone, or trephining several holes through both cortices of the bone in an attempt to improve the blood supply to the area which has become embarrassed by the sclerosing of the bone and its encroachment on the medullary cavity. Meyerding,[8] following removal of a portion of the thickened bone, has dusted the cavity with sulfathiazole and then closed the wound. He also has advised the use of chemotherapy, especially in the acute stages.

Recurrence of the disease has been frequently reported.

The case to be presented is of special interest in that it was seen almost at the onset of the disease so that its progress could be followed both clinically and by

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X-ray through the entire course of the disease from its earliest findings to complete healing. Its similarity, to Ewing's endotheliomyeloma presented a real diagnostic problem. Also the involvement of the disease was unusually extensive, the entire diaphysis being destroyed and replaced. Finally, the treatment of the disease consisted of the extensive use of penicillin, 4,500,000 units, and was non-surgical except for two biopsies when some bone and tissue were removed for examination.

Case Report

A colored male, age 24, was first seen on admission to the hospital on April 17, 1945. The history obtained was that on April 7, 1945, while working he stepped on a pole with his right foot which caused his right leg to shoot out forcibly in front of him and his left leg to extend behind him. In falling, his right leg struck the ground and the knee cap was thrown out of place. He described the knee cap as being displaced to the outer side of the knee. A fellow worker pulled on his right leg and pushed the knee cap back in place. He had severe pain in the region of the right knee cap and in the front thigh muscles following the accident. He was taken to his plant dispensary where he was hospitalized and heat was applied to his right leg. He remained hospitalized in the plant dispensary until April 17, 1945, when he was transferred to the area hospital because of the persistence of pain and soreness in his right leg in the region above his knee.

He gave no history of any previous dislocation of his right patella or any previous trouble with his right knee or leg. There was no history of any previous injury to his right leg. He stated that he had been discharged from the Navy for some trouble which he was having with his right foot, the exact nature of which he did not know. His foot had not given him any trouble since his discharge from the Navy. His present health had been good. He had not had any recent illnesses nor infections. His past history was essentially negative; the usual childhood diseases but no serious illnesses, no operations nor serious injuries. History by systems was entirely negative throughout except for dietary idiosyncrasies which he had because of superstitions. He had had gonorrhea but denied syphilis. His family history offered nothing significant: mother and father were living and well; a twin brother had died at an early age, the cause of whose death was not known but whose death was responsible for his superstitions concerning food.

Admission Examination, April 17, 1945: The patient was a healthy appearing colored male in his early twenties; good development and nutrition. Temperature 99.4°, pulse 60, respirations 18, blood pressure 120/70. His general physical examination was entirely normal except for gingivitis and very marked caries of his teeth. There were no evident dental abscesses. Examination of his right leg revealed tenderness over the distal part of the quadriceps muscles and tendon at and just above the patella. There was no deformity or swelling of the right knee or leg and no excess fluid in the joint or bursa. The patella was in normal position and the tendon not unusually relaxed. Movements of the knee were free and normal in range and there was no relaxation of the cruciate or collateral ligaments. There was no tenderness over the semilunar cartilages. The circulation of the leg was normal and there was no edema. The right foot and ankle were normal.

Laboratory findings on admission, April 18, 1945: Hemoglobin, 15 gms.; red blood cells, 4,400,000; leukocytes, 17,650. Urine examination: specific gravity—1.015; albumin—negative; sugar—negative; microscopic—negative except for 2 to 5 white cells per high powered field; Kahn test—negative.

An X-ray taken of his right knee showing both femoral condyles and the lowermost part of the shaft of the femur was reported negative on April 17, 1945.

Subsequent Course: Following admission the patient was put to bed and heat in the form of hot packs were applied to the region of his right knee. Soreness in the region of the patella and the distal part of the quadriceps muscle and tendon improved but some soreness persisted. He ran a low grade elevation of temperature, reaching a maximum of 100.0° on his first, second, fourth and fifth days of admission with the temperature remaining normal on the third day. During this time he required codeine sulfate, grains ½, and aspirin, grains 10, two to three times in twenty-four hours to control the pain in his knee and leg. On April 20, 1945, the fourth day after admission, the patient's right knee was immobilized in a short circular cast from his mid thigh to the lower third of his leg. His knee became more comfortable. On April 21, 1945, his fifth day after admission, his temperature reached 99.6° and on his sixth day 101.2°.

On April 24, 1945, he was allowed up, wearing his cast and using crutches. On that day, his eighth after admission, his temperature rose to 101° at 6:00 P.M. On his ninth day his temperature reached 101.8° at 6:00 P.M. He continued a 6:00 P.M. elevation of temperature between 100° and 101° on his tenth, eleventh, twelfth, and thirteenth days. During this time the patient was requiring codeine and aspirin approximately once or twice a day. On April 26, 1945, his tenth day, he first began to complain of pain over the anterior and lateral aspect of the middle third of his right thigh. This was thought at the time possibly to be due to pressure from the upper end of his cast as he was walking about. As this pain persisted and became quite bothersome, the cast was removed and heat again applied to the knee and thigh. Also during this time the patient had three mild epistaxes. Repeated examinations for an explanation of his daily fever revealed no explainable source.

On April 29, 1945, the thirteenth day after admission, palpation of his right thigh revealed an unusual feeling of hardness or induration over the femur along its anterolateral aspect in its middle third. X-rays were taken of the femur and an area of dense calcification layered along the middle third of the right femur in its lateral and ventral aspect was seen. (See Fig. 1.)

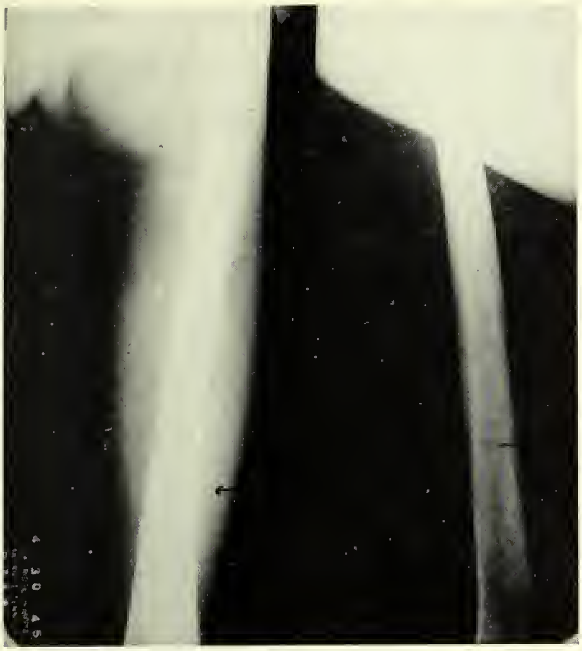

Fig. 1.

This was interpreted by the roentgenologist as myositis ossificans, but the possibility of an endothelial myeloma must be kept in mind. A leukocyte count taken on April 30, 1945, the fourteenth day after admission, was 12,250 cells with 17 per cent lymphocytes, 3 per cent monocytes, 2 per cent eosinophiles, 76 per cent neutrophlies and 2 per cent stab forms. On the fifteenth day after admission, his temperature dropped to 100°. Immobilization of his right leg in a spica cast was considered but the patient left the hospital the next day.

He was not seen again until he reported back to the hospital on May 30, 1945, at which time he stated that he had been staying in bed and taking medicine to relieve the pains in his right leg which were still present. X-rays of his right femur were repeated and he was re-admitted to the hospital. On admission his temperature was 101°, pulse 84, respirations 24, and blood pressure 100/76. There was a large, definitely palpable tumor along the anterior and lateral aspect of the middle third of the right femur with tenderness. The remainder of his physical examination was essentially negative as before, except for the condition of his teeth and gums. The X-rays taken at this time were reported by the roentgenologist as extensive endothelial myeloma of the right femur of an active and rapidly advancing character. (See Fig. 2.)

Laboratory examinations on June 1, 1945, revealed: hemoglobin 10.8 grams; red blood cells 3,450,000; leukocytes 10,750 with 34 per cent lymphocytes, 6 per cent monocytes, 2 per cent eosinophiles, and 58 per cent neutrophiles. His Kahn test was again negative. His urine showed a specific gravity of 1.014, and acid reaction, one plus albumin, negative sugar and occasional white blood cells with some amorphous urate crystals, epithelial cells and yeast.

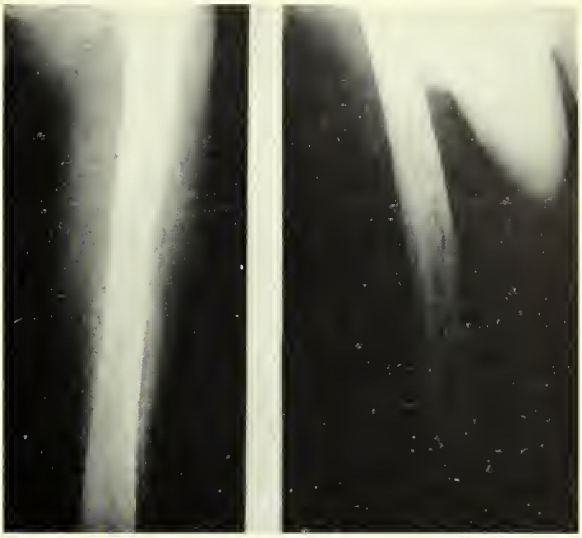

Fig. 2.

An X-ray of his chest taken on June 1, 1945, revealed a mottled rarefaction of the posterior portion of the sixth right rib.

The patient had palpable inguinal glands on both right and left sides. They were small and about equal size. On this second admission his temperature reached 101° for the first and second days, 102° on the third day and 99.4° on the fourth, fifth, and sixth days. On the seventh day, June 6, 1945, he was taken to the operating room and a biopsy taken from the lateral aspect of the right femur and of the bony reaction about the femur in this region. That day his temperature rose to 102.8°. On the eighth day it reached a high of 100.4° as well as on the ninth. It continued to run in the neighborhood of 99° and 100° until the fourteenth day when it became normal and continued so for two days when it again rose to 99.4°. The biopsy wound healed cleanly with a slight amount of bloody serous drainage.

The pathologist's report of the biopsy of June 6, 1945, was as follows: Sections of the soft tissue mass show numerous skeletal muscle fibers marked by focal areas of interstitial hemorrhage. Scattered through the muscle tissue are focal collections of small round cells with hyperchromatic nuclei. In addition, large polyhedral cells with clear cytoplasm containing small hyperchromatic nuclei are noted. About these areas there is abundant matrix probably partially made up of degenerate muscle fibers and proliferating fibrous tissue. Many of the small round cells appear to be plasma cells. Sections of the bone show numerous irregular, atypical bone trabeculae, some of which appear eroded, others of which show new bone formation. Osteoblasts may be seen concentrated around certain bone trabeculae. In the intervening spaces is abundant fibrous tissue containing numerous vascular channels, some of which are filled with blood. Scattered through the fibrous tissue are many round and plasma cells. Diagnosis: Chronic osteomyelitis. Note: The symptomatology in this case together with the X-ray findings suggest endothelial my-

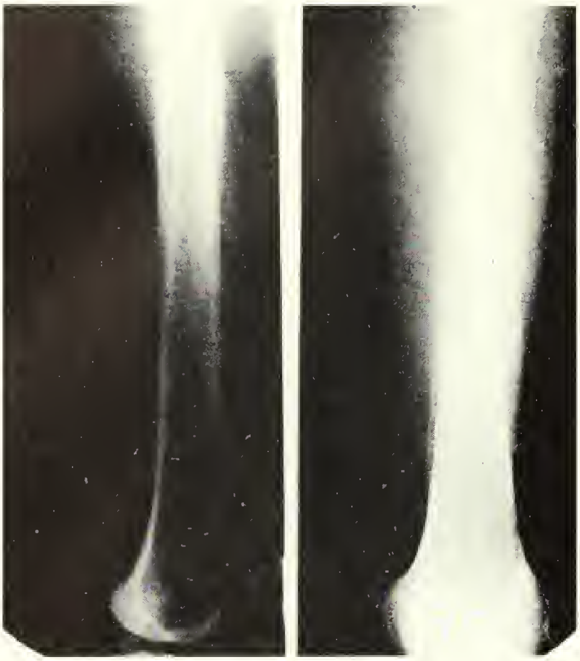

Fig. 3.

eloma. However, in the biopsy material there is a conspicuous lack of evidence to support this diagnosis. In the section of soft tissue fragments are certain cells which strongly suggest the cells seen in endothelial myeloma. However, this evidence is too scanty to warrant the diagnosis. Another biopsy for a more representative fragment of bone is suggested.

X-rays were taken of the patient's skull, pelvis and left femur, all of which were negative.

Other laboratory studies were made and were as follows: blood calcium on three different occasions 6.8 mg., 9.6 mg., 9.4 mg.; blood phosphorus 2.3 mg., 2.9 mg., 2.8 mg.; non-protein nitrogen, 32 mg., urea nitrogen 12 mg.; blood chlorides 400 mg.; prothrombin time 105 per cent of normal; sedimentation rate 29 mm.; acid blood phosphatase, 0.1 B units; alkaline blood phosphatase, 3.1 units; Bence Jones protein negative; prostatic smear—many pus cells with some gram positive diplococci and rods, few epithelial cells.

On June 20, 1945, the twenty-first day of his second admission, the patient was again taken to the operating room and another biopsy taken with the pathologist present. This was taken from the upper lateral right femur just below the trochanteric region and well into the substance of the bone. There was no sign of pus. The bone was soft and of a moth-eaten appearance and easily removed with a gouge. This procedure was followed by a slight temperature rise to 99.6°.

The patient continued to show daily temperature elevations between 99° and 100° with an occasional day of normal temperature. He continued to have considerable pain in the leg requiring codein and aspirin about every four hours until June 26, 1945, the twenty-seventh day after his second admission, when it began to be required only once a day. The second biopsy wound healed cleanly except for some drainage of old blood and serum on June 25, 1945.

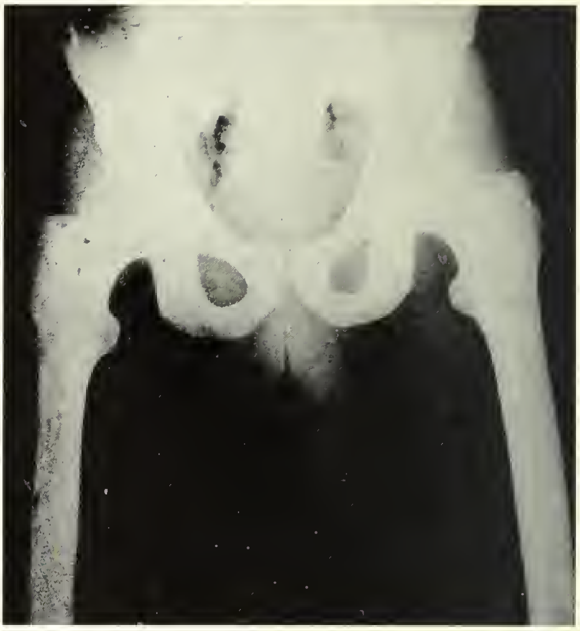

Fig. 4.

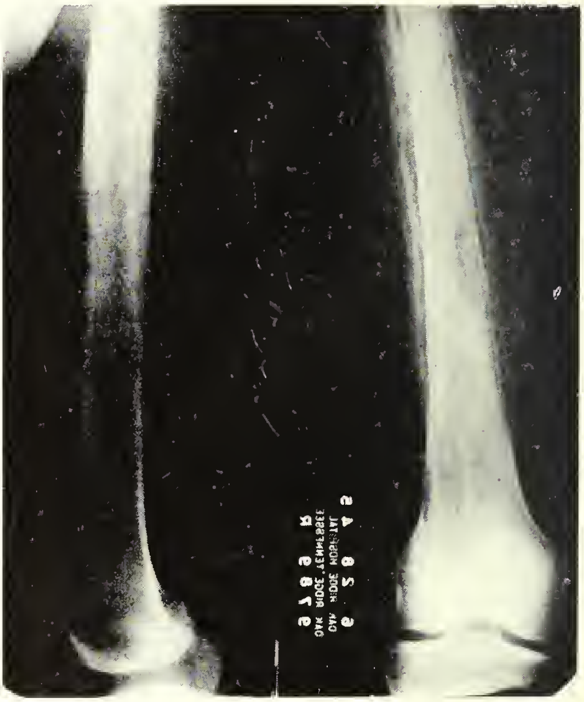

Fig. 5.

Serial X-rays of his right femur continued to show further destruction of the bone and new bone formation. (See Figs. 3, 4, 5.)

On June 28, 1945, a pathological fracture was seen at the junction of the proximal and middle thirds of the

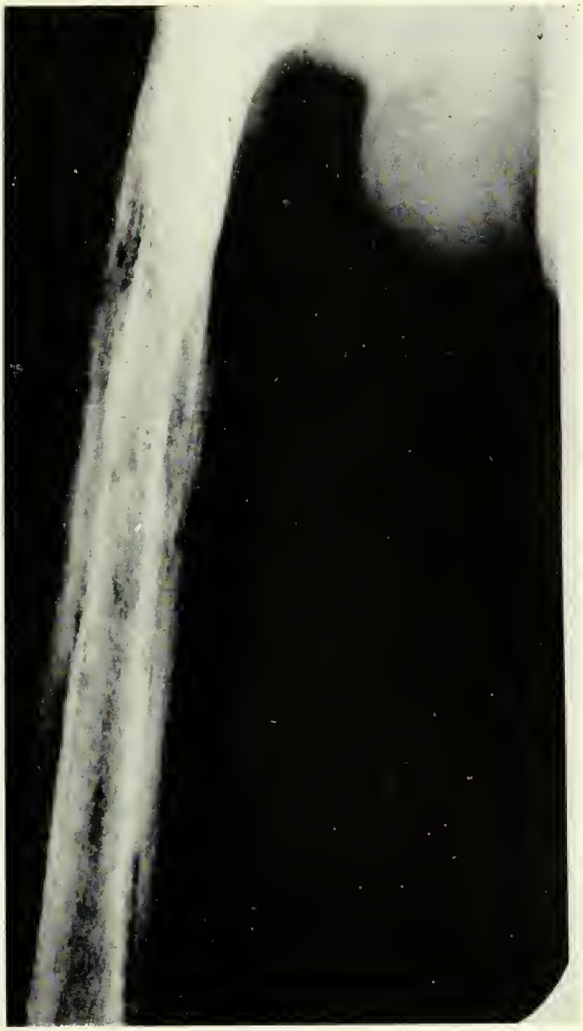

Fig. 6.

femur. A leukocyte count on July 5, 1945, the thirty-sixth day after his second admission, was 6,000 with 34 per cent lymphocytes, 4 per cent monocytes, 13 per cent eosinophiles, 47 per cent neutrophiles, and 2 per cent stab forms. This was the first elevation of eosinophiles which was also seen later but never explained.

The pathologist's report on the second biopsy was as follows: Section of the bone fragments show numerous irregular bone trabeculae varying in size and shape scattered through fibrous tissue matrix. There is active proliferation of fibroblast and immediately adjacent to the bone trabeculae may be seen many osteoblast. In one of the sections there is a dense accumulation of round and plasma cells and in the immediate vicinity may be seen several giant cells. There is a diffuse scattering of plasma cells throughout the section but there is a definite perivascular distribution in several instances. Well marked vascularity is a feature. There is no histological evidence of tumor. Diagnosis: Chronic inflammation of the bone. The tissue which had been taken for culture at the second biopsy had been inadvertently discarded.

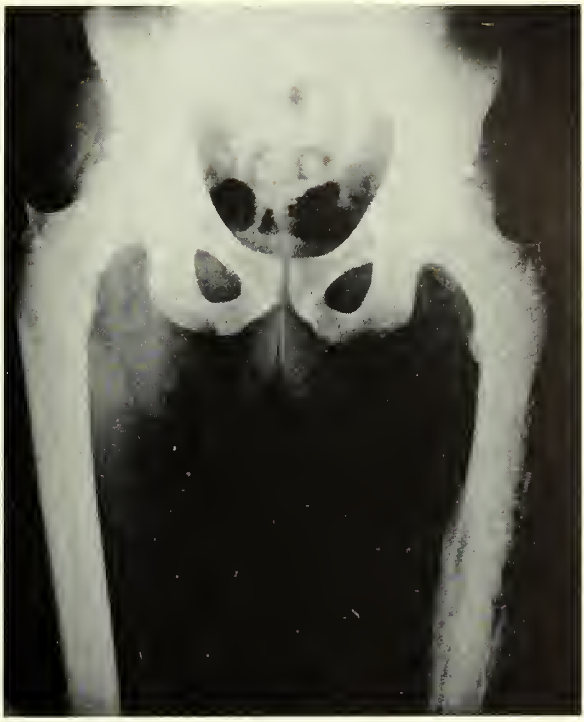

Fig. 7.

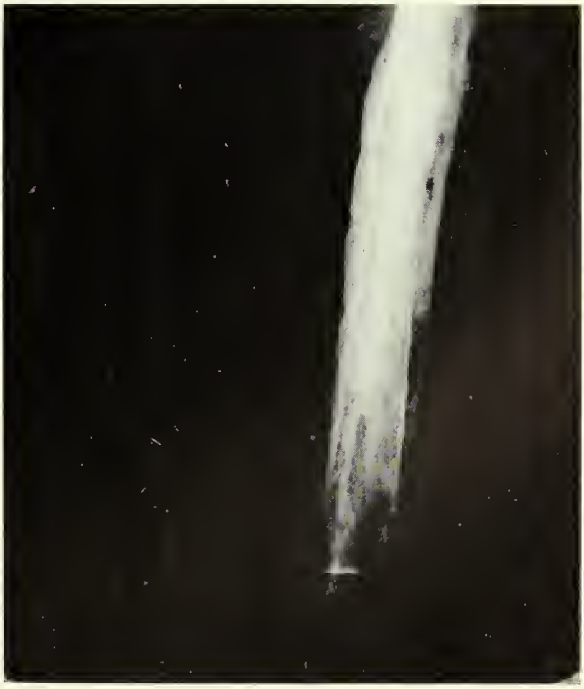

Fig. 8.

On July 13, 1945, the forty-fourth day after his second admission, the patient was put on penicillin, receiving 500,000 units over a period of three and one-half days. He was also put on multivitamin and ascorbic acid on July 16, 1945.

X-rays of the sinuses on July 15, 1945, were negative.

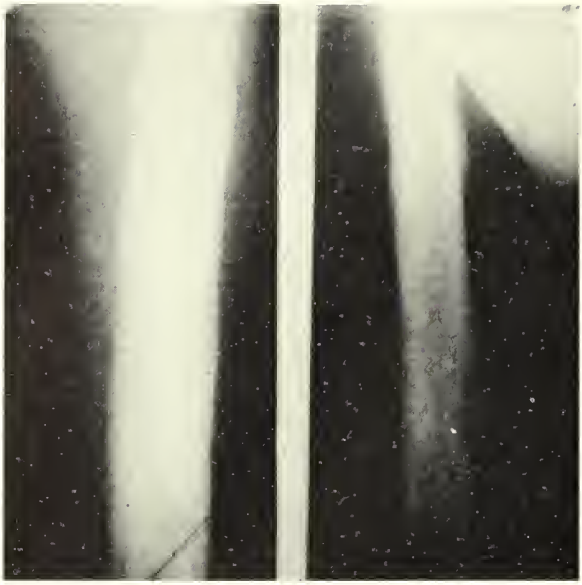

Fig. 9.

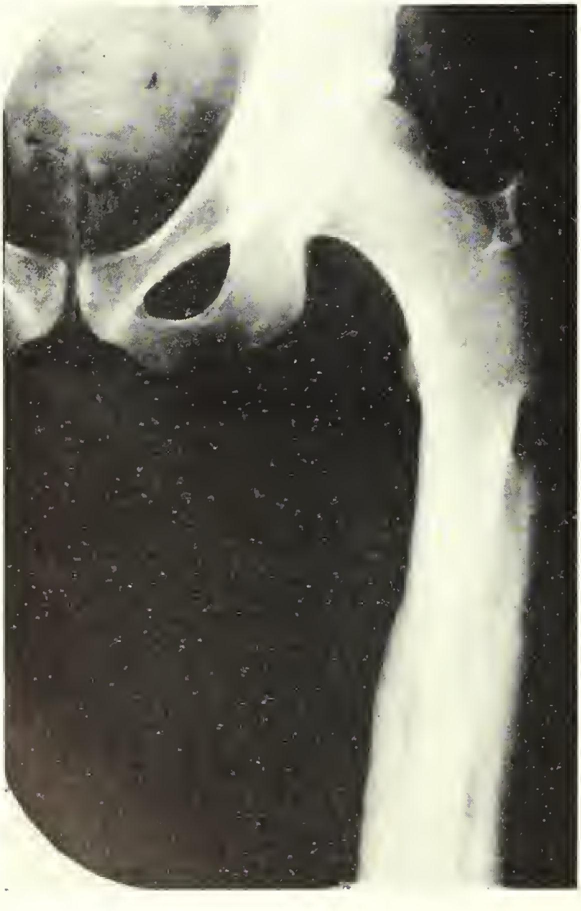

Fig. 10.

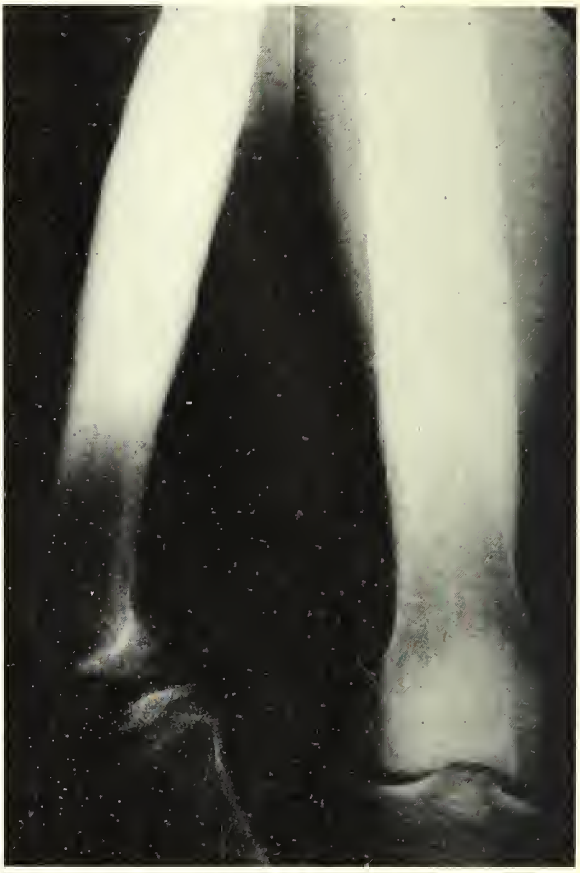

Fig. 11.

X-rays taken on July 17, 1945, showed the marked destruction of the shaft of the right femur with marked periosteal proliferation. There did not appear to be any advancement in the destruction and the pathological fracture had healed. (See Figs. 6 and 7.)

On July 18, 1945, a leukocyte count was 8,400, with 48 per cent lymphocytes, 15 per cent eosinophiles and 37 per cent neutrophiles.

The opinion of two other pathologists corroborated the diagnosis and on July 30, 1945, the patient was again put on penicillin, 20,000 units every three hours. This was continued until 4,000,000 units had been given. X-rays on July 30, 1945, showed no further progression. (See Fig. 8.) Daily temperature elevations between 99° and 100° continued until July 31, 1945, the sixty-second day after his second admission and the one hundred fifteenth day since the onset of pain at the time of his fall. His temperature then remained normal except for an occasional rise to 99°. By this time the patient was feeling quite comfortable and receiving only occasional sedation for pain.

On August 1, 1945, his right sixth rib was X-rayed again and the irregularity and decalcification of the posterior portion was again seen but had showed no change. His temperature remained normal from August 10, 1945, the one hundred twenty-fifth day since the onset of this disease, until he was discharged. From August 14, 1945, no further progression of the disease was noted and a healing process was evident. (See Figs. 9 and 10.)

The patient was allowed out of bed on crutches on September 15, 1945, and allowed weight bearing one week later. He was discharged from the hospital on September 29, 1945.

He was again seen on January 28, 1946, at which time X-rays showed a complete healing of the right femur with marked thickening and sclerosis of the shaft. (See Fig. 11.) He had no discomfort in the leg and complained only of some weakness of the leg and tiring.

Conclusion

1. A case of sclerosing, non-suppurative osteomyelitis of the femur followed from its onset of symptoms to complete healing is presented.
2. Its differentiation clinically and by X-rays from Ewing's endotheliomyeloma presented a difficult problem in its early stage.
3. Its progression was rapid and extensive with involvement of the entire diaphysis of the femur.
4. The treatment was penicillin; a total of 4,500,000 units being used.

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FALL POSTGRADUATE COURSES, AMERICAN COLLEGE OF CHEST PHYSICIANS

The Council on Postgraduate Medical Education of the American College of Chest Physicians is sponsoring three postgraduate courses in the latest developments in the specialty of Diseases of the Chest. Each of the courses will be of one week's duration and is open to all physicians. Tuition fee is $50.00 for each course, and registration is limited to fifty physicians for the courses being presented in Chicago and New York City. Reservations will be accepted in the order received.

San Francisco, California, September 13 through 17, 1948—In cooperation with the University of California Medical School and Stanford University School of Medicine. For information please write to Stacy R. Mettier, M.D., Head of Postgraduate Instruction, Medical Extension, University of California, San Francisco, California.

Chicago, Illinois, September 20 through 25, 1948—Third Annual Postgraduate Course presenting the recent developments in all aspects of diagnosis and treatment of Diseases of the Chest. Course to be held at the Hotel Stevens, Chicago.

New York City, November 8 through 12, 1948—First Annual Postgraduate Course presenting the newer aspects of Diseases of the Chest. Course to be held at the Hotel New Yorker, New York City.

Applications for the courses to be given in Chicago and New York City should be made through the Executive Offices, American College of Chest Physicians, 500 North Dearborn Street, Chicago 10, Illinois.

Sterile Pyuria

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THE term sterile pyuria describes the urinary findings in a rather large number of diseases of the urinary tract. Several cases in which an increased number of pus cells are present in the urine but in which careful study does not reveal a causative organism, may be cases in the terminal stages of a bacterial infection. Urinary calculi may cause pyuria without evidence of bacterial infection but such a condition usually does not continue for long, particularly if instrumentation or manipulation is done. In these cases the diagnosis need not be delayed for long if proper studies are made. There are other conditions causing sterile pyuria, such as inflammatory lesions adjacent to the urinary tract which also should be comparatively easy to diagnose.

Until rather recent years most of us have thought of sterile pyuria as an almost certain indication of tuberculosis of the urinary tract. If we did not find the bacillus by staining, culture or inoculation of guinea pigs, it was felt that a more careful examination would have revealed its presence. There are, of course, some cases of tuberculosis in which such a thought is certainly true.

There is a definite group of cases which can be called a true infective abacterial pyuria. Faltin in 1909 first made mention of cases of sterile pyuria in which tuberculosis could be excluded. Many authors since that time have reported cases of chronic pyuria in which no tuberculous infection was present. In 1933 Wildbolz read a paper before the French Congress of Urology in which he presented the view that abacterial pyuria was a specific disease. He stressed the resistance of the disease to ordinary forms of treatment and its rapid cure by the intravenous injection of an organic arsenic preparation. Since this time there have been numerous articles in the literature about this condition by such authors as Briggs, Cook, Moore, Hamm, Donovan and many others.

INCIDENCE

The largest number of cases reported in recent years have been those in young men, probably because of the large number examined in the military service. However, cases have been reported of both sexes and in nearly all age groups except in persons under 20 years of age. Cases have been reported from all parts of the world.

ETIOLOGY

There have been many theories concerning the cause of the condition, among which are that it is caused by the gonococcus, tubercle bacillus, toxins, syphilis, fungus infection and an ultra microscopic virus. The evidence that any one of these is the causative agent is incomplete.

PATHOLOGY

The number of cases in which tissue has been removed for examination has been small, usually this has been done where an error in diagnosis has been made. Schaffhauser, Runeberg and Peters reported that there was no disease in the renal cortex and that the changes were confined to the ureters and pelves. The mucosa was thickened, edematous and showed varying degrees of erythema.

SYMPTOMS

The first symptom in many of these cases of abacterial pyuria may be a non-specific urethritis, this is followed at varying intervals by marked frequency of urination, severe dysuria and at times hematuria. Usually the temperature remains below 101° F. and no chills are observed.

PHYSICAL FINDINGS

The general physical examination is essentially normal. On cystoscopic examination one finds diffuse reddening and thickening of the mucosa in a bladder of markedly decreased capacity. The edema may be so great as to suggest a tumor of the bladder. There is a slight increase in the leucocyte count and the sedimentation rate may be considerably elevated.

TREATMENT

The response to arsenical treatment is quite prompt and in my experience has been about the same with neoarsphenamine, and mapharsen. Resistance to the sulfa drugs and penicillin is quite constant.

CASE HISTORIES

Case 1. A white male officer 25 years of age first noticed a urethral discharge. Careful examination of the discharge microscopically and by repeated cultures did not show the gonococcus to be present. The patient was given sulfadiazine. During the sulfadiazine therapy he began to have marked frequency of urination and dysuria. The urine contained a large number of pus cells in both glasses. Cultures of the urine showed no growth. Guinea pig inoculations were done and no evidence of tuberculosis was found. There was an elevation of temperature to 101° F. The frequency became so severe that only about 30 cc. of urine was passed at a time. An intravenous pyelogram demonstrated a large hydronephrosis on the right and a dilated ureter on the right throughout its entire length. The lower third of the left ureter was also dilated. Large doses of penicillin were given with no improvement either in the symptoms or in the pyuria. The penicillin was discontinued and neoarsphenamine gm. 0.3 was given every three days for three doses. There was rapid improvement in the dysuria and the frequency; however, the urine continued to contain innumerable pus cells. The temperature promptly returned to normal and after sev-

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Presented at the meeting of Minneapolis Academy of Medicine, April, 1947.

eral weeks the urine became clear. The hydronephrosis remained and the officer was released from the service with the advice that he consult an urologist in civilian life. A cystoscopy and retrograde pyelogram were done and evidently a secondary infection followed for subsequently a right nephrectomy was done. In a recent letter from the patient he stated that he feels well and has no symptoms of urinary tract infection.

Case 2. A 20 year old white male first noticed a urethral discharge. There had been no venereal exposure. Gonococci were not found in the urethral secretion. Sulfadiazine was given and there was some slight improvement in the discharge but within 48 hours there was increased frequency of urination; dysuria and some terminal hematuria appeared. The frequency increased to the point where it was practically incontinence. The temperature reached a maximum of 100.4° F. The leucocyte count was 9,700. The sedimentation rate 8 mm. per hour. Repeated smears of the urine and culture for the tubercle bacillus were reported as negative, also urine cultures all were negative. Cystoscopy showed a diffuse cystitis with a bladder capacity of 75 cc. X-ray examination of the urinary tract showed marked contraction of the urinary bladder and no change in the upper urinary tract. Mapharsen gm. 0.04 was given every three days for five doses. There was a slow but definite improvement and the patient was discharged after 60 days.

This case I believe to be a true infective abacterial pyuria even though the response to the arsenical was not as dramatic as in most of these cases.

Case 3. A 23 year old white male stated that one year previously he had a non-venereal urethritis which improved with penicillin treatment. This recurred in six months and was again treated with penicillin. Two weeks before admission he noticed slight urethral discharge and terminal hematuria. There was dysuria, urgency and frequency of urination of every half hour.

The urine was grossly bloody on admission, specimens taken at a later date contained from 20 to 30 wbc/hpf, leucocyte count was 5,900 and sedimentation rate 32 mm. per hour. Culture of the urine and guinea pig inoculation were negative. X-ray examination of the urinary tract was essentially normal.

Mapharsen was given and quite promptly the frequency and dysuria subsided though the same amount of pus was found in the urine. Bladder capacity increased from 100 to 200 cc.

Three weeks after admission a purulent conjunctivitis developed. Smear and culture of this secretion was negative for any organism. This cleared in a few days with boric acid solution irrigations and penicillin ointment.

One week after the onset of the conjunctivitis the right ankle became swollen and tender. An attempt to aspirate fluid was unsuccessful. X-ray examination of the bones and joint was negative.

The swelling gradually subsided during the following month. At the time of discharge the urine was clear.

Case 4. A 23 year old white male noticed a urethral discharge which was said by a physician to be nonspecific in character. About two weeks later he began to have pains in the low back region. Urinary frequency and hematuria developed. At about the same time conjunctivitis was noticed. Penicillin was given and the amount of urethral discharge decreased. Approximately six weeks after the onset of the urethritis he first noticed pain in the left knee, right ankle and right foot. Fluid was aspirated from the left knee — this fluid contained no organisms and there was no growth in 48 hours.

The leucocyte count remained around 10,000. The urine contained 12 to 30 wbc/hpf. The Wassermann was negative as was the complement fixation test for gonococcus infection. Frie test was negative. The temperature remained under 101° F. Sedimention rate reached a maximum of 82 mm. Hg.

During the hospital stay the index finger nails of both hands thickened, and darkened to a deep brown color.

Both plantar surfaces had extensive thickening of skin, this became hyperkeratotic and peeled off easily. A diagnosis of keratodermia blennorrhagica was made. X-ray examination of the urinary tract showed a moderate contraction of the urinary bladder otherwise normal.

Two months after admission patient was discharged with no symptoms referable to the joints or to urinary tract.

Reiter's Disease

There is one other group of cases which, though not usually mentioned with the sterile pyuria group should, in my opinion, be included. That is the cases which have been given the name of Reiter's disease.

In 1916 Reiter described a triad of symptoms of urethritis, conjunctivitis and arthritis. Reiter originally thought that a spirillum in the blood was the causative agent, but this has not been confirmed. The symptoms in this so-called disease may vary considerably and usually the urinary findings though frequently the first noted are short in duration in comparison to the other symptoms. Recently, more and more cases of this disease are being reported with various skin lesions. Hollander, Fogarty, Abrams and Hydd in 1945 reported 25 cases of Reiter's disease. In 14 of these cases conjunctivitis was not present. In one case circinate lesions developed on the penis and keratotic lesions on the legs and feet. The skin lesions were characteristic of keratodermia blennorrhagica. In another case subungual abscesses appeared on six of the fingers.

Summary

As far as the symptoms and findings referable to the urinary tract are concerned there is considerable similarity between infective abacterial pyuria and the so-called Reiter's disease. Early in the disease if conjunctivitis or arthritis has not developed I know of no way of distinguishing between the two—Reiter's disease and abacterial pyuria.

In both diseases cases of severe damage to the kidney have been reported.

There is definite evidence that arsenical preparations are of benefit and sulfa drugs and penicillin are of no benefit in the treatment of both diseases.

In cases of urinary frequency and dysuria associated with pyuria there is no reason to withhold the giving of arsenical preparations until report of the result of guinea pig inoculation and culture for tubercle bacillus is received. I do believe one might delay treatment for 24 to 48 hours until the result of the ordinary urine culture has been determined.

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AMERICAN STUDENT HEALTH ASSOCIATION

The Counseling Role of the University Student Health Service

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College people have reason to be proud of the development of their student health programs. Health services available to students in colleges are far more adequate than those which are provided at any other level of our educational system.

In general, throughout the country, secondary and elementary schools have not developed the concept of student health service that is commonly accepted in higher education. In the lower grades, health service is confined in large measure to emergency first aid and to a limited amount of mass instruction in the principles of healthful living. The problem of dealing with the health of the child at these levels of education is left almost entirely to the home.

This attitude is understandable as we look at the historical development of student health services in colleges. They, too, paid little attention to institutional responsibility until they were literally forced into providing the beginning of the services we have today. In two or three instances, health services were organized only after severe epidemics among student bodies.

One college president tells that his interest in providing organized health care for students was enlisted only after a parent called him one day for a recommendation of an undertaker for a student who had died. The University of California in 1900 was concerned about the delinquent attendance of students at their classes. A special committee was appointed to look into the matter with a view to providing penalties for excessive absence from class work. Only then did the university discover that, instead of penalties, some other kind of program was needed.[1]

Thus, caring for the sick was the first responsibility assumed by the college student health services. But, it was a very short step from the task of caring for the illnesses of students to the health examination, aimed at preventing the spread of communicable diseases. Then followed provision of services designed to eliminate or ameliorate health defects which might be related to successful student life. Once the examination technique was established, there also followed naturally its use in the screening of candidates for athletics and for vocations such as nursing and teaching.

Thus, the student health service gradually came to be more than a first aid station. It came to be an agency for counseling and education. It is this aspect of the work I wish to stress today. It is my firm belief that the health service in our colleges has a much more important role as educator and counselor than it has assumed or, perhaps more accurately, has been permitted to assume.

In support of this thesis, we should consider the premise that health education, broadly conceived, should be a part of every student's experience. In thus speaking of health education, I interpret it to be more than physical activity, more than learning to go to a doctor when one is sick, more than taking notes on tedious anatomical facts about the human body. These three points, I fear, encompass the average student's notion of health education. Too seldom has he been given the point of view and the philosophy that health education as well teaches a way of life expressed in play and recreation, in nutrition and diet, in health habits and personal hygiene, and in attitudes toward preventive and remedial medical service.

In thus defining health education, we must recognize that we are dealing with the emotions of people, for emotions are important in the learning process. It took nearly fifty years for people to accept a hospital as something other than a place to die. We have now changed this mind-set, rooted in people's emotions. But we haven't yet changed the average person's attitude that sends him to his doctor only when he is ill — altogether too frequently only when he is seriously ill. We are told that if we could get people to go to the physician as a preventive measure when they are well, the scourge of death attendant upon three of the greatest killers of our people, cancer, tuberculosis and circulatory diseases, could be greatly minimized.

In another health field, people's ideas of nutrition and diet are often limited to information about calorie counts and weight reduction. Beyond that many do not understand that they can quantitatively be well fed and at the same time be undernourished. We haven't yet succeeded in teaching our people how to eat.

These are very simple illustrations, but they are representative of the task that must be done.

The college should send forth the graduate as an intelligent practitioner of healthful living, a disciple of preventive medicine and public health, who will practice his knowledge within the circle of his own family and friends and use his influence as a community leader for the improvement of the community itself.

There will, no doubt, be little disagreement with this objective, but there may be considerable question as to how it can be achieved. Up to the present, the chief

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Address presented at the 26th annual meeting of the American Student Health Association, Detroit, Michigan, May 7, 1948.

*President, Wayne University, Detroit.

means which have been employed have been departments of physical education or health education, or courses in hygiene required of all students. However, some institutions have established a comprehensive follow-up plan as part of their health examination technique. This procedure of working directly with individuals as counselors or with small groups as teachers is indispensable, I think, in truly effective health education.

In all institutions there have been set up more or less elaborate procedures for academic counseling. There has also developed a great emphasis upon vocational counseling, in which the adviser seeks to reach the individual, to measure his motivation vocationally, to discover his most promising aptitudes, and to try, on an individual basis, to get him happily adjusted into his life's work. We accept these tasks as important responsibilities of our institutions and we have established rather elaborate machinery for their accomplishment.

But there is a third area of student need and student interest which up to the present has not received the same kind of emphasis or attention as the two just mentioned, and that is the area of personal development or personal growth. Here the student needs counseling on his personal problems. These needs are interwoven, of course, with academic achievement and vocational motivation, but they also are related to many non-institutional aspects of the student's life, of which health is certainly a large and vital part.

Health education as I have defined it, cannot be achieved through courses alone or through the institutional physical education pattern and the examination procedure of the past. We shall transmit the essential information and we shall achieve the more difficult task of changing the attitudes of students only when we individualize the work. This, it seems to me, includes conscientious follow-up of all examinations on an individual basis, the organization of small groups for informal and personal discussion, and leadership in emphasizing the health aspects of other university services, such as food service, counseling, recreation.

While, for convenience of discussion, we can classify student needs under three headings, we cannot treat those needs separately. The counseling services of an institution must be integrated. One area which brings all these counseling needs together is that of mental hygiene. I know that a discussion of this topic deserves a full-length presentation, and that here it is only possible to list briefly some of the problems that confront us in this field: how to get more and better psychiatric counseling; how to persuade students to use the counseling we have without feeling some kind of social disapprobation; how to improve the methods of diagnosis in order to reach more who need the service; and how to get psychiatric workers to understand institutional problems.

In this overview of the student health service, I have outlined more tasks than can at once be performed. A quite justifiable response would be: "It's all very well to talk about such a broad program, but where are the resources for it to be found, when we do not have enough for what we are now doing?"

There is not a clear answer to that question, but I believe that health service directors must give leadership to the interpretation of the program on a broadly-conceived base. The student health service must be a part of the total educational program of the institution—not something tacked on by virtue of an auxiliary student fee. Of course, it is in competition with other university needs for new and additional resources, but up to this point, in general, throughout the country, the interpretation has been such that health service is not competing on an equal footing. And I do not think it will until the concept of the work is broadened and until the service claims a place as an educational program in the best and fullest sense of the word. If those who provide health care for students are to share equitably in the expanding program of higher education, they must clearly state and strongly document their claim for *educational* consideration.

The war gave us a setting for increased attention to health and health service in all areas of endeavor. It created a climate for a new emphasis upon and new understanding of public health. The return of the physically conditioned veteran; the rationing program, with its public education on nutrition; the training in first aid; the establishment of nursery schools and parent education on child care; the increased physical training —all of these programs and others were combined into a great public campaign on health for victory. At the same time we had remarkable progress in therapy, which came to have greater public understanding than ever before. The improvements in chemotherapy, physiotherapy, psychiatry, research which produced the sulfa drugs and penicillin—these and other notable achievements made a great impact upon the public mind.

We should ask ourselves the question: "Are we taking advantage of this new setting, of the new understanding so that we can make a stronger impact on student life?" For one, I don't think we are. I don't think we are adequately building upon the new attitudes developed during the war.

I believe that the health service people in our colleges must lead the way in interpreting the importance of a more vigorous institutional program. They must tell us how to proceed. They must popularize the subject. I know that this is a job they do not relish. As one who works with a medical school and a college of nursing and a college of pharmacy, and other professional health workers, I know that constitutionally, these scientifically-minded people shy away from this kind of popular interpretation. They think that this task is somebody else's responsibility. Perhaps it ought to be, but the facts of life—institutional life—point out that there is no one else to do the job as well.

I believe that if those in the student health services of our institutions will accept the role of counselor and educator as well as physician, the next decade will produce even greater achievement and greater progress than have taken place in the past.

REFERENCE

1. Reinhardt, G. F.: University of California Infirmary Student Health Protection, *Proceedings,* Fourth International Congress on School Hygiene, V (1913), 161.

American Student Health Association

MINUTES OF THE COUNCIL MEETINGS

First Session

President H. D. Lees called the meeting to order at 8:30 P.M., May 6, 1948, at the Hotel Statler, Detroit, Michigan. Those present were:

Harry D. Lees, M.D.
Warren E. Forsythe, M.D.
Lawrence W. Holden, M.D.
E. Lee Shrader, M.D.
Max L. Durfee, M.D.
Ruth M. Collings, M.D.
K. Leora McCloskey, M.D.
John E. Sawhill, M.D.
Ruth E. Boynton, M.D.
Harold D. Cramer, M.D.
George T. Blydenburgh, M.D.
Irvin W. Sander, M.D., Guest,
Chairman, Program Committee.

The Minutes of the New York meeting of Council last year were accepted in mimeographed form. The mimeographed reports of the secretary-treasurer were approved. The following two bills were ordered paid:

1. Bill presented by Doctor Shrader, Chairman of the Local Sections Committee for the printing of the Annual Reports of Section Secretaries	$17.40
2. The bill presented by Doctor Holden for the expense of making up eight copies of a set of ink tracings of representative floor plans for student health service buildings	$54.62

The payment of a bill for $16.40 presented by Doctor Durfee, Chairman of the Committee on Tuberculosis, was withheld pending a request from him to the National Tuberculosis Association, that this bill be paid by it in accord with our agreement made last year.

Letters of greeting from Doctors Raycroft and Shepard were read.

The Report of the First Conference on the Health of College Students in England, held in July of last year at Queens College, was presented.

Brief reports were presented by the Chairmen of the Council Committee on Local Sections (see Committee reports) and the Council Editorial Committee.

The following Motions were passed:

1. That a Special Committee be appointed by the President, to study a proposal to set up general standards of organization and practices in Student Health Services in member institutions. — Moved by Doctor Boynton, seconded by Doctor Collings.
2. That the refunds to Sectional Student Health Associations be discontinued. — Moved by Doctor Forsythe, seconded by Doctor Durfee.

   This motion was made after discussion of the budget for the remainder of the calendar year.

   It was suggested that in the future it may be necessary to send only one copy of the Annual Proceedings to the library of each member institution.

   Another suggestion was that a financial saving might be made by not publishing a Proceedings of an Annual Meeting until the papers, reports and business minutes had been published in the Journal-Lancet.
3. That the motion in the Council Meeting of 1945, requesting an Annual Report from each Health Service in member institutions be rescinded.

In a lengthy discussion concerning the methods of promoting the general welfare of the Association, many ideas and suggestions were presented.

1. Since Doctor Roberts resigned his position soon after his appointment as chairman of a new committee on public relations, it was suggested that someone might be appointed to take his place. (Minutes of Minneapolis meeting, May 3, 1945: "Dr. B. D. Roberts was appointed chairman of a new committee on public relations to bring in recommendations as to suitable activities for the American Student Health Association in this field.")

2. Directors of Public Relations in member institutions might be notified when some member of that institution is elected to some office in Student Health organizations, reads a paper at an annual meeting or makes some other contribution in this field. Editors of sectional medical journals might also be notified.

3. Chairmen of Standing Committees might contact all representatives of member institutions who have expressed an interest in the area of the committee's interest.

4. A paper dealing with some subject within the area of a committee's interest may be presented annually between meetings by some committee members, for publication in the Journal-Lancet.

5. Officers of Section groups might make surveys of health services in institutions in their section areas and urge membership in the American Student Health Association. The Illinois, Ohio and Michigan Sections have set an example.

6. Descriptions of Health Services in certain types of institutions might be printed in pamphlets covering the various types of institutions, and be made available to institutions not members of the A.S.H.A., as well as to members desiring them.

It was also suggested that Doctor Sawhill represent the Association at the National Conference for cooperation in Health Education, when it meets in New York, and Doctor Hillier when it meets in Washington.

A list of institutions applying for membership in the American Student Health Association, approved by the Executive Committee, was read and referred to the Association meeting for election.

The meeting adjourned at 11:00 P.M.

George T. Blydenburgh, M.D., Secretary-Treasurer

Second Session

The second session of Council was held at 12:30 P.M. May 8th, Dr. H. D. Lees presiding.

Under the provision of Paragraph 2 of Section III of the Constitution, Doctor Cramer moved and Doctor Canuteson seconded, that the following past Presidents of this Association be made honorary members of Council:

John Sundwall, M.D.
Joseph E. Raycroft, M.D.
Harold S. Diehl, M.D.
James Edwards, M.D.
Dean F. Smiley, M.D.
Charles E. Shepard, M.D.
Joseph Ritenour, M.D.

—Motion unanimously passed.

Doctor Canuteson moved, Doctor Forsythe seconded, that Article III of the Constitution be amended to provide that the officers of this Association shall be:

1. A President
2. A President elect
3. A Vice-President
4. A Secretary-treasurer

and that such other changes in the Constitution shall be made in adjustment to this change. — Motion passed.

It was moved by Doctor Holden, seconded by Doctor Forsythe, that the Council accept the invitation of the Pacific Coast Section, to hold the next meeting of the Association in the area of this Section, during the Christmas vacation of 1948, the exact place and time to be determined by the Executive Committee in consultation with the Section officers. — Motion passed.

The meeting adjourned at 2:00 P.M.

George T. Blydenburgh, M.D., Secretary-Treasurer

ASSOCIATION MEETINGS

First Session

The meeting was called to order by the President, Dr. H. D. Lees, at 10:10 A.M., May 7th.

It was announced that the minutes of the New York meeting of Council and of the Association, as well as the reports of the Secretary-treasurer, had been mimeographed and distributed, and would be acted upon at the next Session, Saturday morning, May 8th.

The Secretary announced:

The death of Dr. Anna M. Gove, for many years Director of the Department of Student Health at the Woman's College of the University of North Carolina, on January 28, 1948.

The retirement from active service, of: Dr. Edwin Fauver of the University of Rochester, and Dr. Glenadine Snow of Michigan State Normal College.

That the Proceedings of the Third National Conference on Health in the Colleges had been delayed in printing but might be in the mail before summer.

The minutes of the First Meeting of Council were read.

The applications of the following institutions were read and unanimously accepted:

Institution Representative

Chicago Professional Schools—Frederick C. Lendrum, M.D.
College of St. Francis—Sister Miriam Edward, O.S.F.
Duquesne University—Ned J. McCague, M.D.
Santa Barbara College—Wilfred T. Robbins, M.D.
University of Illinois
(Undergraduate Div., Chicago, Ill.)—Earl B. Erskine, M.D.
University of Illinois,
Galesburg, Illinois—Homer L. Lawder, M.D.
Johns Hopkins University—Frank R. Smith, Jr., M.D.
Marietta College—Deane H. Northrup, M.D.
North Dakota Agricultural College—Charles A. Sevrinson, B.S.
Queen's University—P. M. Macdonnell, M.D.
St. Olaf College—Donald H. Petersen, M.D.
Youngstown College—Mary B. Smith, M.A., A.B.
Texas Technological College—Embree R. Rose, M.D.
Albany State Teachers College—Matie E. Green, M.D.
University of Southern California—Paul O. Greeley, M.D.
Wheaton College—Miss Christine White
University of Arkansas—Fount Richardson, M.D.
MacMurray College—Bessie E. Oakes, R.N.
Lake Forest College—Paul H. Burgert, M.D.
Louisiana State University—William B. Chamberlain, M.D.
Hamline University—Floy E. Fruvog
University of California—Donald S. MacKinnon, M.D.

The following representatives were appointed to be a Nominating Committee:

Ralph I. Canuteson, M.D.
Warren E. Forsythe, M.D.
E. Lee Shrader, M.D.

The, Business of the Session completed, Doctor Lees presented the President's Address, "The Student Health Service in the Post War Era."

GEORGE T. BLYDENBURGH, M.D., Secretary

Second Session

The second session of the Association was held at 2:10 P.M. May 8, President H. D. Lees presiding.

The Secretary read the minutes of the Second Session of Council. — Doctor Gossage moved, Doctor Sander seconded, that the minutes of the New York business sessions (1947), and the reports of the Secretary-treasurer be accepted as presented in mimeographed form. — Motion passed.

Doctor Houck moved, Doctor Holden seconded, that the applications for membership in this Association, presented and approved by the Executive Committee and Council after the First Session of this meeting, be accepted. — Motion passed.

The Nominating Committee presented its nominations:

1. President: H. L. Marshall, M.D., University of Utah.
2. Vice-President, Laurence B. Chenoweth, M.D., University of Cincinnati.
3. Secretary-Treasurer, Lawrence W. Holden, M.D., University of Colorado.

Members of Council, term ending 1951:

1. Jacob D. Farris, M.D., Emory University.
2. Floyd Riggs, M.D., Indiana State Teachers College.
   Replacement of Walter Batchelder, M.D., term ending 1950: Frederick M. Marty, M.D., Syracuse University.

Doctor Boynton moved, Doctor Hillier seconded, that nominations be closed, the report of the nominating committee be accepted and the secretary be instructed to cast an unanimous ballot, for the election of these nominees. — Motion passed.

Adjourned 2:30 P.M.

GEORGE T. BLYDENBURGH, M.D., Secretary

AMERICAN STUDENT HEALTH ASSOCIATION NEWS

The twenty-seventh annual meeting of the American Student Health Association is to be held in San Francisco December 30th and 31st, 1948. The decision to hold this meeting in December, rather than in May, was reached by the Council and was later voted on by the members present at the Detroit meeting.

Refunds to Local Sections were discontinued by action of the Council at the Detroit meeting. Local Sections will, therefore, in the future have to look to other sources for revenue. This action was occasioned by the increased cost of operating the business of the Association as a desire to continue without having to increase the dues to the member institutions.

Dr. Harold D. Cramer, Director of the University Health Service at the University of Idaho, Moscow, Idaho, writes that he has an opening for a physician on his staff. The appointment is for ten months, starting September 1, 1948.

R. B. Michener, M.D., who is finishing a temporary directorship of the Student Health Service at the University of Wyoming, Laramie, Wyoming, is leaving and is interested in a student health service position in the west. Dr. Michener's address is 1114 Harney Street, Laramie, Wyoming.

The JOURNAL LANCET

Official Journal of the

American Student Health Association
Great Northern Railway Surgeons' Association
Minneapolis Academy of Medicine
North Dakota State Medical Association
Northwestern Pediatric Society
Sioux Valley Medical Association
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Editorial

THE MINNEAPOLIS ACADEMY OF MEDICINE PRESENTS—

The Minneapolis Academy of Medicine has for many years published its proceedings in serial at irregular intervals in the Journal-Lancet. Realizing that material worthy of publication might also be worth preserving, an arrangement has been made for the editors to present the papers, theses and discussions of the past year in a single issue of that journal.

The Academy, therefore, takes great pleasure in presenting to the Journal-Lancet readers this record of its 1947-48 sessions in the hope that in this form it may prove more accessible and useful.

Thomas J. Kinsella, M.D., President,
Minneapolis Academy of Medicine

M.A.M.'S 28 INSPIRING YEARS

The Minneapolis Academy of Medicine is one of the outstanding medical societies in existence today. While it has a history of only 28 years, it was founded with a definiteness of purpose which has kept it a most splendid organization during all of that time. The distinguished objectives, as stated in the Constitution, are an inspiration to all of us: "The Minneapolis Academy of Medicine shall be a scientific organization, meeting regularly for the presentation and discussion of original papers on clinical subjects, abstracts from medical literature, abstracts of medical history, studies of clinical cases, pathological specimens, and other clinical information. It shall be the object of this Academy to promote better relations and closer cooperation among members of the medical profession, to aid specialization in medicine, and to promote Minneapolis as a medical and surgical center." The membership is divided between senior and active members, but it can be said that the programs are of such excellence that both senior and active members are obviously thoroughgoing in their interest and efforts on behalf of the group.

A medical organization is as important as the purpose which it serves, and to this end the Minneapolis Academy of Medicine is a very worthwhile institution both in the medical and in the civic life of the community. Its influence is widespread and it is hoped that in the years to come the Academy may continue to promote the best ideals in the practice of medicine.

A. E. Cardle, M.D.

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PREPARATION OF MANUSCRIPTS

JOURNAL-LANCET extends an invitation to the profession for articles with the understanding that they are original contributions not previously published.

Manuscripts are to be typed on one side of the paper with double spacing. Illustrations must be in the form of glossy prints or drawings in black ink. Please do not attach legends to the pictures. A reasonable number (two or three) illustrations are published free of cost; special arrangements must be made for excess or highly finished illustrations or tables.

Bibliographic references should be at the end of the manuscript and not in footnotes. Each reference should include the following information in the order indicated: Name of author with initials; title of article; name of periodical; volume, page and year. Reprints are prepared on order.

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The JOURNAL LANCET

Minneapolis, Minnesota
September, 1948

Volume LXVIII, No. 9
New Series

Meningitis in Infancy and Childhood

L. G. Pray, M.D., and M. H. Poindexter, Jr., M.D.*
Fargo, North Dakota

The prognosis and treatment of meningitis has been altered considerably as a result of recent advances in antibiotic therapy and chemotherapy. For this reason a discussion of the present status of the disease and a report of our experience over a six year period seem in order.

Meningitis may occur at any age, but is most common during the first two years of life,[1,2,3] and to a decreasing extent during the age from two years on throughout the remainder of childhood. This is thought to be due to greater permeability of the blood-brain or meningeal barrier during infancy and early childhood, and to a lack of antibodies in the blood at this age period.[4,5,6] In most cases, the causative organism gains entry to the meninges from the respiratory tract by way of the blood stream, passing through the choroid plexus into the cerebrospinal fluid. It is also possible for organisms to reach the meninges by direct extension from an infected focus such as a mastoid, from a fractured skull, or by lumbar puncture through infected or unsterile tissues. Tuberculous meningitis may result from rupture of a brain tubercle into the subarachnoid space.[7]

The most common forms of meningitis are the purulent bacterial forms; it is those which we wish to consider. Table 1 shows an etiological classification of meningitis. Meningococcus and tuberculous meningitis are the two most common varieties, followed by pneumococcus, H. influenzæ, streptococcus, staphylococcus, colon bacillus, and others in approximately that order.[1,8,9,10] In our own experience, meningococcus meningitis has more than twice outnumbered any other form in the age group over two years, but has not been as common as other varieties in infants.

Table 1
Classification of Meningitis

Bacterial	Virus	Other
Meningococcus	Mumps	Spirochetes (syphilis)
Tubercle bacillus	Lymphocytic choriomeningitis	Torula
Pneumococcus		Streptothrix
H. influenzæ		Toxoplasma
Streptococcus		
Staphylococcus		
E. coli		
E. typhosa, salmonella, etc.		

Diagnosis and Treatment

The diagnosis is easy in the typical cases in which there is stiff neck, positive Kernig and Brudzinski signs, positive Babinski signs, high fever, chills, headache, vomiting, extreme irritability often with cloudy sensorium and convulsions; petechiae are an important sign of meningococcus meningitis. However, it is sometimes impossible to make a diagnosis of meningitis on the basis of symptoms and physical signs alone; this is especially true in infants. Kernig, Brudzinski, and Babinski signs are sometimes lacking or equivocal; a bulging fontanel is found fairly frequently, but may be absent if a baby is dehydrated. On the other hand, the presence of meningismus or the occurrence of convulsions may lead one to suspect meningitis when it does not exist.

Presented at the annual meeting of the North Dakota State Medical Association, May 23, 1948, at Jamestown, N. D.

*From the Department of Pediatrics, The Fargo Clinic, Fargo, N. D.

Lumbar puncture yields the only definite proof of meningitis; it should be performed as soon as possible on any patient even faintly suspected of having this disease. In infants a small short needle should be used, 2 inches long, number 22. There is seldom any need for local anesthesia; general anesthesia is never indicated except in the presence of protracted convulsions. A cell count of 1,000 to 10,000 per cubic millimeter, with a preponderance of neutrophiles establishes the diagnosis, although counts may occasionally fall either below or above these limits. Examination of smear and culture determines the organism. Protein is above normal, sugar and chlorides below normal values. Blood and throat cultures are made as additional aids in diagnosis.

The treatment of meningitis must be directed both at eliminating the offending organism and maintaining the hydration, nutrition, and general well being of the patient. These latter factors are of the greatest importance in the younger age group in which dehydration and acidosis may quickly cause a fatal metabolic disturbance. Almost all of these patients vomit during the acute stage of their illness, and the intake by mouth is always insufficient to maintain hydration. Diarrhea also occurs not infrequently. In order to combat severe dehydration, fluids must be given intravenously as well as subcutaneously, and should include 5 per cent glucose solution, Ringer's or isotonic solution of sodium chloride, and one-sixth molar sodium r-lactate or lactate-Ringer's solution; whole blood, blood plasma, or Amigen are needed almost routinely after dehydration has been overcome (Table 2). For giving intravenous fluids to infants a scalp vein is usually most accessible; a number 25 or 26 hypodermic needle is used with a set for forcing the fluids through the tiny vein. One calculates the amount of fluid for a 24 hour period as roughly 2½ ounces per pound of body weight; sometimes twice this amount has to be given during the first 24 hours to overcome extreme dehydration. For a single intravenous infusion the optimal amount is 10 cc. per pound of body weight. A continuous intravenous drip is sometimes needed in severe cases; this is obtained by cutting down on an ankle vein, inserting a ureteral catheter and tying it in place with cotton or silk sutures. If the entire length of the catheter is used, there is no need to tie the baby's leg to a restraining board. The drip can be allowed to run at a slow rate (8 to 15 drops per minute) for several days.

TABLE 2
Supportive Treatment in Meningitis

1. Fluids: Glucose solution, Ringer's, lactate Ringer's, normal saline solution, plasma, whole blood, amigen, one-sixth molar sodium lactate.
   Route: Intravenous
      Continuous (8 to 15 drops per minute)
      Interrupted (10 cc. per lb.)
    Subcutaneous
    Oral
   Amount per 24 hours: 2½ oz. per pound of body weight.
2. Stimulants of limited value
3. Oxygen
4. Sedation, sponges, enemas
5. Injections of heparin and air to prevent subarachnoid block.

Sulfonamides are of value in treatment of the majority of the meningitides (Table 3). Sulfadiazine has been found to be as effective and safe as any of the sulfonamides; there is no evident advantage in combining two or more sulfonamide compounds.[11] The optimum blood level of sulfadiazine is from 10 to 15 milligrams per cent, although higher levels are often safe and lower levels are often effective. The spinal fluid level is usually maintained at about one-half of the blood level by diffusion through the blood-brain barrier. During the acute stage of the disease the drug is given intravenously or subcutaneously as the sodium salt, 0.5 per cent to 5 per cent in Ringer's or saline solution every six to twelve hours; if the intravenous route is used, the required amount is allowed to drip into the vein over a two to three hour period. After improvement begins parenteral administration is discontinued in favor of the oral route at four to eight hour intervals. The dosage is 2 grains per pound of body weight during the first 24 hours, half of which is included in the first dose. One grain per pound of body weight is the basic daily requirement thereafter, but dosage must be varied according to the blood levels obtained. Daily blood levels are advisable during the first few days and less often thereafter; a micro method requiring 0.1 cc. of blood makes frequent determinations possible. Spinal fluid sulfadiazine levels should be determined on several occasions also. Frequent blood counts and urinalyses are essential. Treatment is continued until spinal fluid cultures have been negative for one week and definite clinical evidence of cure has occurred.

Penicillin is of therapeutic value in meningitis due to the pneumococcus, meningococcus, streptococcus, staphylococcus (Table 3), and some of the rare forms. It is given both intramuscularly and intrathecally. If a continuous intravenous drip is in place, penicillin can be included in the drip instead of being given intramuscularly. The usual intramuscular dosage is 10,000 to 20,000 units every three hours, although larger doses are sometimes employed. Dosages of 10,000 units every three hours in infants and 20,000 units in children have been found to give a blood plasma level of about 0.04 units per cc., with a range of 0.01 units to 0.1 unit per cc. Therapeutic levels against most organisms fall within this range. Intrathecal administration is necessary because diffusion through the meningeal barrier has been found to be slight [12,13,14] even when large intramuscular or intravenous amounts have been employed. It is usually given once daily in doses ranging from 5,000 to 10,000 units. Amounts as large as 50,000 to 100,000 units have been advised and used by some authors,[15] but are probably unsafe, as penicillin in such amounts has an irritative convulsive effect on brain cells.[12,16,17] Our own procedure has been to give not more than 10,000 units daily by gravity, 1,000 units per cc. of normal saline solution, after removal of an equal or larger amount of cerebrospinal fluid.

Streptomycin has specific effect in influenzal, tuberculous and E. coli meningitis (Table 3), as well as some

Table 3
Outline of Specific Therapy*

Etiologic Agent	Drug	Route of Administration
Meningococcus	Sulfadiazine Penicillin	Intravenous, subcutaneous, or oral Intramuscular; also intrathecal in severe cases
Tubercle bacillus	Streptomycin, "Promizole" (of some value)	Intramuscular and intrathecal Oral
Pneumococcus Staphylococcus Streptococcus	Sulfadiazine Penicillin	Intravenous, subcutaneous, or oral Intramuscular or intravenous; also intrathecal
Hemophilus influenzæ, type "B"	Sulfadiazine Streptomycin Specific antiserum	Intravenous, subcutaneous, or oral Intramuscular and intrathecal Intravenous; also intrathecal in certain chronic cases
E. coli	Sulfadiazine Streptomycin	Intravenous, subcutaneous, or oral Intramuscular and intrathecal

*Modified from Lawson, R. B., and Kelsey, W. M.: The Treatment of Meningitis in Childhood with Particular Reference to the Use of Penicillin and Streptomycin. N. Carolina M. J. 8:211, 1947.

of the less common forms. The work of Alexander has shown the value of streptomycin and also outlines a therapeutic regime of streptomycin administration in H. influenzæ meningitis.[18,19] Her contributions to the treatment of this disease are well known, from the treatment with sulfonamides with some reduction of mortality then specific rabbit antiserum, which reduced the mortality to about 45 per cent,[20] and finally the addition of streptomycin with still further improvement in prognosis. She advises both intramuscular and intrathecal administration, not alone but in combination with sulfadiazine and serum. The intramuscular dosage is 20,000 units per pound of body weight per 24 hours. This is divided into eight doses at three hour intervals. The intrathecal dosage is 25,000 to 50,000 units once daily (in 5 to 10 cc. of normal saline solution). The total number of injections depends on the response of the patient and the effect on spinal fluid cultures and chemistry, but intrathecal administration is rarely continued for more than four days.

Alexander stresses the importance of making a prompt diagnosis of influenzal meningitis. The diagnosis should be considered when Gram-negative rods or even pleomorphic diplococci are found on direct smear of spinal fluids. The diagnosis can be established in a few minutes by testing for capsular swelling with type *b* diagnostic serum. If no organisms are present on direct smear, 1 cc. of the purulent spinal fluid is planted in 10 cc. of Levinthal broth. Until etiology is established, sulfadiazine is given intravenously in amounts comparable to those used in other forms of meningitis. When the diagnosis is established, rabbit antiserum is given in continuous drip with 200 to 300 cc. of Ringer's or saline solution over a two hour period; the amount to give can be determined by the spinal fluid sugar level as in the accompanying table (Table 4). A skin or conjunctival test precedes its intravenous use. An hour after the infusion of serum, the adequacy of the dose is checked by testing the ability of the patient's serum to produce capsular swelling in 1:10 dilution. This test is repeated daily for several days. If capsular swelling occurs no further serum is indicated. At the same time, there should be improvement in spinal fluid with regard to culture, sugar, protein, chlorides, and cell count. Serum is given intrathecally only in intractable cases.

Table 4
Initial Dosage of H. Influenzæ Antiserum

C.S.F. Sugar (mg. per 100 cc.)	Antibody Nitrogen (mg.)
0–10	150
10–25	100
25–40	75
40 or above	50

Alexander and others have advised intrathecal injections of heparin and air in cases in which a suspicion of beginning subarachnoid block exists. In such cases 1 cc. of heparin (10 mg.) may be given intrathecally every 48 hours until improvement occurs. Air injections may be given once or twice at four or five day intervals, 50 to 70 cc., following removal of a somewhat larger amount of fluid. X-ray studies following this procedure also help rule out the possibility of abscess formation. Alexander has noticed no ill effects from these procedures, and favorable results have occurred in some patients.

In tuberculous meningitis, Hinshaw, Feldman, and Pfuetze [21] have reported nine cases treated with streptomycin intramuscularly and intrathecally, of which four recovered. Of the four recovered patients, one made an apparent complete recovery, one was blind, one was deaf, and one had cerebellar symptoms. Their treatment consisted of intrathecal administration of 100 to 200 mg. of streptomycin every 24 hours for from two to six weeks. The patients also received intramuscular streptomycin 2 to 3 Gm. daily, every four to six hours for six months.

A more recent paper by Lincoln and associates [22] reports seven children with tuberculous meningitis treated with a combination of streptomycin and promizole. Of the seven children, six made an apparent recovery without mental impairment; of these, one had strabismus, and another had coarse tremors of the upper extremities. Their usual intramuscular dosage is 2 Gm. daily, every six to twelve hours for six months, reduced or stopped temporarily for toxic symptoms. Intrathecal streptomycin is given for two months, 100 mg. daily for the first week, then every two days. After six weeks it is reduced to 50 mg. After two months spinal taps are done at intervals of a week to a month to guard against relapses. The toxic symptoms are most frequent after intrathecal administration and consist of ataxia, nystagmus, transient strabismus, and vomiting, occurring most commonly after three to four weeks. Rashes occurred in three patients. One child had elevated non-protein nitrogen and casts during third and fourth weeks. There was no case of deafness.

"Promizole" is a sulfonamide which seems to augment the effect of streptomycin, although unsuccessful in benefiting or curing tuberculous meningitis alone. It is administered orally in a dosage of 0.5 to 1.0 Gm. every six to twelve hours to a point where a blood level of 2 to 3 mg. per cent is obtained. After six months a daily maintenance dosage of 1.0 Gm. is usually sufficient. Promizole causes thyroid enlargement in two to five months. There was no leukopenia and no effect on sex maturation in any of Lincoln's patients, although such complications are known to occur occasionally.

During the first month of therapy there was sometimes even progression of symptoms. During the second month improvement began to appear. Cell counts were normal in all by the end of the fourth month. Spinal fluid sugar was normal in three to twelve weeks. Spinal fluid protein was normal in three to five months in all but one patient.

PROGNOSIS

The improvement in mortality rate in the various forms of bacterial meningitis since the discovery of specific therapies may be seen in Table 5. The use of horse serum alone resulted in a marked reduction of mortality in meningococcus meningitis, but had little effect on others forms. With the use of sulfonamides, penicillin, streptomycin, and rabbit antiserum in appropriate cases, there has been a marked drop in death rate in all forms of bacterial meningitis, including possibly even tuberculous meningitis. The mortality figures in Table 5 are only approximations, as some authors report much lower figures, while other writers report less favorable results. The incidence of neurological sequelae in young infants remains fairly high in spite of early and energetic treatment, but even in that age period statistics show a considerable improvement in recovery rate.

Table 5

Mortality in Meningitis

Organism	No Specific Treatment	Horse Serum	Present Therapy
Meningococcus	75%	20 to 30%	10 to 15%
Tubercle bacillus	100%	100%	50 to 100%
Pneumococcus	100%	95 to 98%	20 to 40%
H. influenzæ	100%	80 to 100%	20 to 40%
Streptococcus	99%	95 to 98%	20 to 30%
Staphylococcus	100%	100%	50 to 60%
Other (bacterial)	100%	100%	50 to 80%

AUTHORS' CASES

In our own cases it may be seen (Table 6) that 28 patients with meningitis have been treated during a six year period, over one-half of whom were under one year of age, and 43 per cent six months of age or younger. The most common organism was the meningococcus, but this was not present in any of our patients under one year. The tubercle bacillus, pneumococcus, H. influenzæ, streptococcus, staphylococcus, and E. coli were less common infecting agents, but were present more frequently during infancy. Of this latter group, excepting cases due to the tubercle bacillus, only two cases occurred in patients over six months of age.

Our results varied with the infecting organism. The best results were, of course, obtained with meningococcus meningitis; nine out of ten patients survived without any sequelae; one 22-month-old infant expired about four hours after admission in a convulsion. He had received intrathecal penicillin on admission in a supposed dosage of 10,000 units in 10 cc. of physiological saline solution, but this was later found to have been 100,000

Table 6

Mortality Rate in Bacterial Meningitis During a Six Year Period Between 1942 and 1948

Organism	Age of Patient					Total	Outcome	
	1–6 mos.	7–12 mos.	1–2 yrs.	2–6 yrs.	6–14 yrs.		Lived	Died
Meningococcus	0	0	1	8	1	10	9	1
Tubercle bacillus	0	2	0	1	1	4	0	4
Pneumococcus	3	1	0	0	0	4	4	0
H. Influenzæ	3	0	0	0	0	3	0	3
Streptococcus	2	0	0	0	0	2	2	0
Staphylococcus	2	0	1	0	0	3	3	0
E. coli	3	0	0	0	0	3	3	0
Total	12*	3	2	9	2	28*	20	8

*One case had both staphylococcus and E. coli.

units. In spite of some reports in the literature to the contrary, it is felt that this large intrathecal injection of penicillin must have contributed to the outcome, even though the infant was critically ill and debilitated on admission.

All four patients with tuberculous meningitis died without treatment. Three of the four were seen before any treatment was available. The fourth case was that of a seven-month-old infant who was not treated because of the dubious results obtained when streptomycin was first used in such cases. However, in view of Lincoln's favorable results it is our plan to treat future cases of tuberculous meningitis with a combination of streptomycin and promizole.

Four infants with pneumococcic meningitis all survived without any serious neurological sequelae. One patient was five days of age, one was one month old, another was three months old, and the fourth was seven months of age. This last infant was the only one with sequelae, which consisted of occasional convulsions which were well controlled; mental and physical development were normal two years later.

Three patients with influenzal meningitis died. All three were six months of age or younger. No cases have been seen during the past three years. In one case, subarachnoid block and hydrocephalus had already developed when first seen. In the other two cases, the disease was fulminating, and there was also some delay in identification of the organism and obtaining of specific rabbit serum. At the present time, diagnostic and therapeutic serum are kept on hand at all times. The recent addition of streptomycin to the treatment of this disease should also result in improved prognosis.

Two patients with streptococcus meningitis and three patients with staphylococcus meningitis all survived. One patient with streptococcus meningitis and one with staphylococcus meningitis made a complete recovery. The other three patients, of whom two were seven days old and the other twenty-one days old, developed serious neurological sequelae.

Of three young infants with E. coli meningitis, one made a complete recovery; this infant was thirteen days old. The other two, seven and twenty-one days of age, developed subarachnoid block and hydrocephalus; one of these also had staphylococci in the spinal fluid.

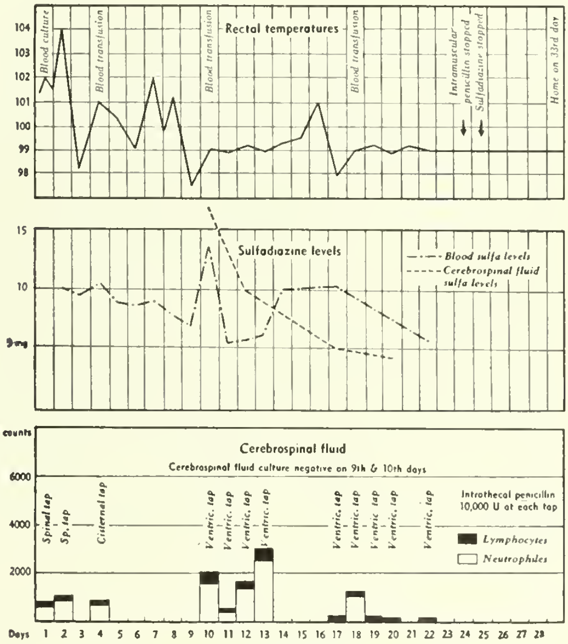
One case of pneumococcic meningitis is reported in full to illustrate the details of therapy.

Report of Case

Case 1. B. J., a white female, age seven months, was admitted on June 11, 1945. There was a history of febrile illness for nine days which seemed to improve and then get worse. Five days after onset she was hospitalized elsewhere and given penicillin intramuscularly. On the day of referral, June 11, she developed left-sided twitching of face and extremities. The past history and family history were non-contributory.

Physical examination. The patient appeared critically ill, with irritability and tenseness of the body and extremities. Temperature was 104° F. rectally. Nutrition and hydration were fair. The fontanel was full and pulsating. The back was stiff and the neck resisted flexion. Reflexes were variable. There were no petechiae. Other findings were negative.

Laboratory data. Spinal puncture was done on admission; fluid was slightly cloudy under increased pressure. There were 599 cells per cu. mm., with neutrophiles 86 per cent. Sugar was 29 mg., chlorides 709 mg., protein 93 mg. Smear and culture showed Gram-positive diplococcus which was identified as pneumococcus type 14. Blood culture yielded the same organism. Admission blood count showed red blood cells 4.0 million, white blood cells 28,600, with an infectious shift on differential count. Urinalysis was negative on admission and repeatedly thereafter. Tuberculin test (PPD No. 2) was negative in 48 hours. By the fourth day, spinal fluid sugar rose to 40 mg. and protein dropped to 60 mg. On the twenty-first day, protein was 8 mg. Other data, including blood and spinal fluid sulfadiazine levels, are on the accompanying chart (Figure 1).



PNEUMOCOCCUS MENINGITIS WITH RECOVERY

Fig. 1. Case 1. K. J., age seven months.
Erratum: For 9th and 10th days read 10th and 11th.

Treatment and clinical course. Intrathecal penicillin 10,000 units in 10 cc. of normal saline solution was given at the time of the first spinal tap and the following day. After two lumbar punctures it became difficult to obtain fluid by that route; a cisternal puncture was done on the fourth day withdrawing fluid and injecting penicillin 10,000 units. Later it became necessary to do intraventricular taps when free flow of fluid could not be obtained from the cisterna magna. Intramuscular penicillin dosage was 5,000 units every three hours, a small amount by present standards. Subcutaneous normal saline solution 250 cc. with sodium sulfadiazine 1.25 Gm. was given shortly after admission and every eight hours until the third day, when sulfadiazine was started by mouth in a dosage of 0.5 Gm. every eight hours, which later had to be increased to every six hours to maintain a satisfactory blood and spinal fluid level.

During the first 24 hours sodium luminal, oxygen and coramine were administered several times because of convulsions and cyanosis. The patient was able to take a weak formula in small amounts on the second day and in gradually increasing amounts thereafter. Supplements of vitamins A, D and C were added after several days. Scalp vein blood transfusions were given on three occasions. Penicillin was discontinued on the twenty-fourth day; sulfadiazine was stopped on the twenty-sixth day. The patient was discharged on the thirty-third day, gaining and apparently normal. She has progressed well since except for occasional convulsions.

SUMMARY AND CONCLUSIONS

During a six year period 28 patients with meningitis have come under our care. Twenty of them have survived, 16 without any serious neurological sequelae. Excluding four patients with tuberculous meningitis who died, the mortality rate is 16.6 per cent for the entire group. Twelve patients were six months of age or younger; 18 were under two years of age; 26 of the 28 were under six years of age. There were 10 patients with meningococcus meningitis, four patients with tuberculous meningitis, four with pneumococcus meningitis, three with H. influenzæ meningitis, two with streptococcus meningitis, two with staphylococcus meningitis, two with E. coli meningitis and one with staphylococcus and E. coli meningitis.

Therapy of the various forms of meningitis has been outlined and discussed. Considerable improvement in prognosis has resulted from the use of new antibiotic and chemotherapeutic agents during the past twelve years. An interesting recent development are reports of recoveries in cases of tuberculous meningitis treated with streptomycin and promizole. Early diagnosis by means of spinal puncture is essential; this is especially true during infancy when the classical signs and symptoms of meningitis are often lacking.

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LEO G. RIGLER LECTURE

The annual Leo G. Rigler Lecture in Radiology will be given by Dr. Merrill C. Sosman, Professor of Radiology, Harvard University Medical School, on Thursday evening, October 28, at the University of Minnesota Medical School. The subject of the lecture will be "Roentgenological Aspects of Heart Disease."

The Retropubic Approach in the Treatment of Cancer of the Prostate

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Grand Forks, North Dakota

In the United States, more than twice as many men die from cancer of the prostate as from cancer of any other organ. Different investigators report a 5 to 30 per cent incidence of cancer of the prostate found at autopsies of men over 50 years of age. Moore of St. Louis believes it to be somewhere between 12 and 18 per cent. When serial sections of prostates obtained at autopsies of men over 50 were studied by Baron and Angrist in 1941, they found cancer to be present in 46 per cent. Of the seventeen million men over 50 years of age in the United States, there are probably as many as eight million (certainly over five million) who have cancer of the prostate.

Prostatic cancer is often present even when the examining finger in the rectum can find no evidence thereof. Hinman reported recently that in the last ten years he has had 43 cases of cancer of the prostate that were not diagnosed by rectal palpation but were discovered by microscopic examination of the material removed at the operation. Professor Vernet, of Barcelona, Spain, after having made serial sections of hundreds of prostates which had been removed under the impression that they were non-malignant, found malignancy in 85 per cent.

In cancer of the prostate there may be no history of bladder neck obstruction. If such a history is present it will be of months' duration, while in benign hypertrophy the obstructive symptoms have been troublesome for years. A man who has cancer of the prostate is fortunate if he also has benign enlargement of the gland, as he will then seek medical advice sooner. Without the coexisting benign hypertrophy, he usually comes to the doctor complaining of pain (backache and sciatica) and not of urinary symptoms. On examination, the growth is often found to have spread and metastasized; consequently it is too far advanced for cure by radical surgery.

Young, Colston, Hinman, and others have reported cures in over 50 per cent of early cancer of the prostate with radical surgery. A case is considered "early" while the new growth is still within the capsule; that is, when the gland is somewhat enlarged, contains nodules, has a feel of stony hardness, but is movable to the examining finger. Hinman has found that only 5 per cent can be classified as "early".

Colston, in a study of 200 cases at the Brady Urological Institute, found that 75 per cent of advanced cancer of the prostate was improved by stilbestrol. By giving stilbestrol daily to a case that has been diagnosed as moderately advanced, there will be a softening of the gland; and in one or more months' time, the gland will be smaller and more mobile. Such a case, judged incurable before treatment with stilbestrol, has now some chance of cure if subjected to radical surgery.

Young's radical prostatectomy, which for many years has held out the only hope for cure of prostatic cancer, is a formidable procedure with an operative mortality of from 8 to 10 per cent. Added to this is the chance of incontinence, which used to be quite common. However, due to some improvements in technique, such as Vest's idea of bringing the bladder and the urethra together with sutures that do not constrict the external sphincter, this has been partially overcome. Belt's idea of leaving the apex of the prostate on the urethra has, of course, lessened the danger of damage to the external sphincter, but it has also lessened the chance of cure by leaving a portion of the gland and its capsule, which sometimes contains cancer. The writer, therefore, does not wholly agree with Huggins, who recently mentioned the Belt modification as an improvement over Young's radical operation in combatting prostatic cancer.

Conceivably, many old men have been killed by being forced to assume and remain in the extremely uncomfortable position necessary in the performance of the Young operation. The already embarrassed circulatory system might have withstood the strain of the anesthetic, the blood loss, and the operative shock, had the position on the table been comfortable. This objectionable position is called the exaggerated lithotomy position and must be so extreme that the perineum is parallel with the floor.

When operating for cancer of the prostate, we usually have a patient who is old and very often afflicted with arthritis and cardiovascular disease. Have we been justified in placing and forcibly retaining such a man for an hour or more in this frog-like posture while attempting to do a difficult operation in a space limited by the rami pubi above, the tuber ischii on each side, and the rectum below, forming an operative field, the depth and inaccessibility of which necessitates the use of a boomerang needle? Common sense tells us that:

1. The patient's circulatory system is handicapped by the exaggerated lithotomy position;
2. Young's radical prostatectomy is time-consuming; a short stay on the operating table is, therefore, impossible;
3. The potency of these factors—the position on the table and the time element—is being multiplied in ever-increasing ratio as time passes.

Progress is often made by radical departure from the beaten path of customary procedure. This is exemplified in Millin's retropubic prostatectomy.

In the spring of 1947, the writer went to London to see Millin's work.* The first case he witnessed was an early cancer of the prostate. The diagnosis was made after the gland had been exposed, and the decision was then made to perform a radical prostatectomy. The writer was impressed with the ease with which this could be done, in comparison with Young's radical operation. Retropubically, an equally thorough operation can be done with no danger of invading the rectum, and without injury to the external sphincter. The cut edge of the bladder can be sutured more accurately and with less difficulty to the urethra than in the Young operation, and therefore with less danger of injury to the external sphincter. Of greatest importance is the fact that in the retropubic operation a much more thorough examination can be made of the gland. If any nodules (which could be missed by rectal examination or while doing a conservative perineal operation) are felt, the radical removal can be done, the only departure from the regular Millin retropubic prostatectomy being the removal of the gland with its capsule intact, together with the vesicles and a portion of the trigone; and also the passing of a catheter through the urethra with traction toward the pubis to facilitate the suturing of the bladder to the cut end of the urethra.

One of the English characteristics especially well-known in this country is their capacity for "understatement." This conservative tendency is not exhibited, however, in their past nor present treatment of certain human ailments. Dr. Lane, of London, took out the large bowel for constipation; Dr. Wilson Hey, of Manchester, is removing the trigone together with the prostate when treating prostatism; Terence Millin brought forth the retropubic prostatectomy;† and now, H. S. Souttar suggests removing the whole prostate in every case and suturing the bladder to the cut end of the urethra and to the triangular ligament, thus eliminating the prostatic cavity and many dormant cancer growths.

Although for some years yet there will be controversy about how a benign prostatic enlargement should be treated—whether by suprapubic transvesical enucleation, transurethral resection, a conservative perineal enucleation, or a Millin retropubic enucleation—there can be no controversy as to which operation is the one of choice for the cure of early cancer of the prostate.

A man who had been to a famous clinic in the Mid-West for examination moved suddenly to Washington, D. C. From there he visited a near-by equally famous clinic whose advice was a different type of operation for his enlarged prostate. Because of this difference of opinion, he decided to go to a third clinic which was highly recommended by a friend. Here he was told to have his prostate removed by a third method. Had this man been at Millin's Clinic in London, he would undoubtedly have been advised to have his prostate removed in still a different manner. These clinics cannot all be right, nor all wrong in their advice.

The writer believes that this man, and others like him, should be examined by someone who has a knowledge of all the existing types of treatment and that there should be no difficulty in selecting the type of operation best suited for his particular case. That he is entitled to and should have such service from all reputable clinics, regardless of their geographical locations or "zones of influence" should be obvious.

Before seeing Millin do this operation for cancer of the prostate, removing the whole prostate (without opening its capsule), the seminal vesicles, and a large part of the trigone, and suturing the bladder to the urethra for an effective anastomosis without injury to the external sphincter, the writer had difficulty in deciding how to advise a patient with early cancer of the prostate. Should he advise the Young radical operation which held out the only hope of cure but which also carried a high mortality rate and a definite risk of incontinence? Or should he advise a transurethral resection to establish a channel through which the bladder could empty itself, and then depend upon castration and stilbestrol for combatting the growth of the cancer? The latter plan of treatment for cancer of the prostate has been in use for years by many leading urologists who never felt that the chance of cure with the Young radical operation—with its high operative mortality and chance of incontinence—was enough to overbalance what they could offer their patient by hormone therapy and, if necessary, repeated resections—with its low mortality rate and slight chance of disturbance of urinary control.

Because of the high rate of malignancy found by many different investigators upon making serial sections of the glands removed which were diagnosed as non-malignant, it may be that the future will bring radical prostatectomies by Millin's method or some modification thereof as the operation of choice, applicable to all cases of prostatism in which there is a worthwhile life expectancy. Undoubtedly such a radical procedure would save many lives and also obviate much suffering due directly or indirectly to cancer of the prostate.

SUMMARY

Cancer of the prostate is alarmingly common. Recent work by investigators, making serial sections of glands removed which were diagnosed as benign, shows that cancer is present in a high percentage. Early cancer of the prostate does not alone produce obstructive symptoms. Early cancer is therefore seldom found without coexisting benign hypertrophy which causes the patient to seek medical aid.

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*Millin is an able operator and takes great pains to demonstrate clearly each step in the operation which bears his name, and any general surgeon who is mechanically agile can learn the procedure quickly.

†In June, 1947, the writer was present at the Surgical Congress for the Scandinavian countries and Finland which was held in Stockholm. One day was given over to Urologic Surgery and it was brought out that Dr. Henrikson of Goteborg, Sweden, had reported the retropubic operation ten years before Millin reported his work. He said that he had done 67 retropubic prostatectomies and then abandoned the operation because he had too many fistulae and strictures. This, of course, was before sulfa drugs and penicillin, and his complications were undoubtedly due to infection.

The difficulty of making a diagnosis of early prostatic cancer and the patient's tendency to postpone medical examination have made the incidence of operable cancer of the prostate very low.

Approximately 50 per cent can be cured by radical prostatectomy, and the percentage of operable cases can be increased by stilbestrol and castration.

Millin's radical retropubic prostatectomy should definitely replace Young's radical operation. This is also true of the conservative retropubic prostatectomy which is simpler and safer than the conservative perineal procedure, and a more surgically correct procedure than the transvesical enucleation.

Besides obviating the necessity of subjecting an old man to the exaggerated lithotomy position, the retropubic prostatectomy provides better access to the operative site, giving the operator a better chance to examine the gland for the presence of cancer. There is less danger of injury to the external sphincter, and no danger of entering the rectum.

The virtues of each of the now existing types of operation for the relief of prostatic obstruction (whether caused by benign growth or by added malignancy), should be reviewed and definitely evaluated to be applied judiciously so as to suit the patient's needs rather than the surgeon's abilities or the current whims of the local clinic.

The question is raised as to the feasibility of radical removal of the gland in all prostatic obstruction, thus obviating the possibility of future cancer of the prostate.

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CHEST CONFERENCE FOR GENERAL PRACTITIONERS

A three-day course on tuberculosis for general practitioners is scheduled for October 18, 19 and 20 at the University of Minnesota Center for Continuation Study.

The study course on tuberculosis and other diseases of the chest is a co-operative project of the American Trudeau Society, the University of Minnesota and the Minnesota Public Health Association (state Christmas Seal organization). County Christmas Seal organizations participated by appropriating funds enabling two doctors from each district medical society of the state to attend the course.

A group of state and national medical leaders in tuberculosis will be on the program. Topics to be covered in the three-day meeting include: physical examination in the diagnosis of tuberculosis; differential diagnosis of hemoptysis, pleurisy and pleural effusion; skin tests in the diagnosis of chest diseases; laboratory aids in the diagnosis of diseases of the chest; the family physician and chest X-ray surveys; chronic bronchitis and bronchiectasis of the lungs; fungus diseases of the chest; immunization in tuberculosis; the sanatorium and the private physician in the management of tuberculosis; antibiotics and chemotherapy in the treatment of tuberculosis.

A Case Report of Drug Delirium Clinically Interpreted as Being Due to Pyribenzamine

George M. Lott, M.D.
Edgar S. Krug, M.D.
Herbert R. Glenn, M.D.*

Recently we experienced the development of an acute psychotic picture, in an otherwise stable young woman, during an acute illness in which Pyribenzamine was given orally to control a skin reaction to one of the antibiotics.

This patient, S. P., age 20, an undergraduate student at The Pennsylvania State College, was admitted to the College Infirmary with a history of chills, headache and fever. Her past medical history was essentially negative. Several days before admission she began suffering from a head cold complicated by persistent headache. On the night before admission she had suffered rather severe headache, with chilling at irregular intervals, and fever. Her physical examination in the hospital was entirely negative except for some nasal congestion and slight reddening of the mucosa of the post nasal pharynx. Her temperature on admission was 102.°. An acute ethmoid infection with involvement of the frontal sinuses was decided upon as the most likely cause of her illness.

Sulfadiazine 1.0 Gm. and sodium bicarbonate 1.0 Gm. were ordered every four hours. In addition, penicillin 50,000 units intramuscularly was given every four hours. Under this regime of treatment she improved rapidly so that during the third day after admission she was afebrile and symptomless.

About 3:00 P.M. on the third day she suffered a severe chill which was followed by a fever of 104°. No new physical findings were uncovered at this time and her mental reaction was entirely normal.

On the following day her fever had subsided to 99.4° and a generalized macular rash had appeared over the entire body which was diagnosed as a drug dermatitis. The sulfadiazine and sodium bicarbonate were discontinued and Pyribensamine, in the dosage of 100 mgs. every four hours, was added to her medical regime to control the drug sensitivity. The dosage of penicillin was continued without interruption. Approximately 48 hours after Pyribenzamine was added to this patient's treatment schedule, and after a day without complaint and without fever, she awoke from a sound sleep talkative and incoherent. Her clinical picture at this time was one of complete recovery from her original cause for admission and, since the skin eruption had disappeared, early discharge from the hospital had been contemplated just prior to the development of abnormal mental symptoms.

For the next 12 to 18 hours she remained extremely confused and claimed that she heard the doctors discuss her case in the hallways outside of her room. Later she blamed the nurses for crying because they knew that she was going to die and said that they kept watching and whispering outside of her door.

During morning rounds the following day, she was found to be fever-free and a complete physical examination failed to disclose any positive findings. She was still very confused and talkative and stated that among other things she knew that her tongue was going to be removed by the chief of staff but that she was strongly opposed to such surgery. She continued to talk of her fear of death and also continued to accuse the nurses as stated above.

A psychiatric consultation was requested and a short time later the staff psychiatrist interviewed this young woman. He reported that "she was oriented satisfactorily and that there was a flavor of delirium to the delusionary and hallucinatory symptoms. The pulse was rapid, 118, and the girl was extremely apprehensive. There were no positive neurological findings."

She reported an interesting derangement of mental processes during this consultation as follows: "Last night I thought I was going to die by bleeding from the legs, urethra and mouth. I saw blood all over the bed. I woke up. I was dreaming with my eyes open. Again, I saw some eyes looking at me through the door."

We felt that this peculiar bleeding phenomena was quite likely an association with a rather severe nosebleed which she had suffered early in the treatment of her sinusitis or due to the onset of her menses which had started the previous day.

The psychiatric opinion favored a drug delirium and Pyribenzamine, being suspected from a previous case report on another antihistamine drug, was stopped, leaving only penicillin in her treatment regime from the original schedule. A single dose of barbital, 10 gr., was given for sedation.

Noticeable improvement in the delusionary and hallucinatory symptoms occurred within four hours after withdrawal of Pyribenzamine from the patient's treatment. The symptoms of delusion and hallucination progressively disappeared to the extent that 12 hours after the last dose of Pyribenzamine this patient was considered to be mentally normal.

Sensitivity to drugs was indicated in this young woman, not only by the development of a drug dermatitis and a delirium, but also by the more than usual drowsiness that followed a single dose of barbital.

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*From The College Health Service, The Pennsylvania State College, State College, Pennsylvania, Herbert R. Glenn, M.D., Director.

Three days later this patient was discharged from the Infirmary as cured.

Discussion

This delirium was clinically attributed to the use of Pyribenzamine and is, therefore, open for discussion as to some proof for this conclusion.

When this patient first began to be confused, we immediately considered some meningeal involvement from her ethmoiditis. This, however, was repeatedly ruled out by the failure to find any positive neurological signs at any time during this disturbance.

Pyribenzamine was suspected because of a case report published in recent literature and also because no other medication, save penicillin, had been administered to this patient in the previous sixty hours. Penicillin was continued in large doses throughout the entire hospitalization and the mental symptoms disappeared promptly during its continuous administration after the withdrawal of the Pyribenzamine.

The evidence would be quite conclusive if the psychosis could be reproduced by similar dosages of Pyribenzamine, we did not feel justified, however, in attempting to cause a recurrence of this delirium by giving a second course of Pyribenzamine.

The 100 mgs. of Pyribenzamine every four hours, although more than the usual dose, is commonly used by us with no untoward effects in both acute and chronic allergic conditions and is considered to be well within the recommended range of dosage and no toxic overdose reaction seemed possible to us, especially when the drug was discontinued within 48 hours.[3,4]

The rapidity with which this case returned to a normal mental status after the discontinuance of Pyribenzamine seems clinically significant from the causative agent angle.

Summary

A case of acute delirium resembling a psychosis is reported as clinically due to and coincident with the use of Tripelennamine (Pyribenzamine) Hydrochloride in a patient suffering from an acute upper respiratory infection and a drug dermatitis.

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CENTER FOR CONTINUATION STUDY ANNOUNCES COURSES

An intensive two week course in Psychosomatic Medicine will be given at the Center for Continuation Study of the University of Minnesota. The course is designed to assist the general physician in the diagnosis and treatment of psychosomatic problems. The course will be presented during the two week period from September 20 to October 2. Enrollment will be limited to 25 physicians because much of the material will be presented by means of group discussions and supervised clinical work.

The Department of Postgraduate Medical Education also announces a course in Traumatic Surgery and Orthopedics to be given for general physicians October 7-9 in the Center for Continuation Study of the University of Minnesota. Registration for this course will be limited to 100 physicians.

AMERICAN STUDENT HEALTH ASSOCIATION NEWS

J. D. Farris, M.D., University Physician at Emory University, Emory University, Georgia, since June 15, 1943, resigned June 15, 1948, to become University Physician, University of Kentucky, Lexington, Kentucky, beginning September 1948.

Oberlin College reports that Dr. Robert H. Browning has been appointed Director of the College Health Service, starting this fall.

The University of Wyoming is in need of a Director of their Student Health Service. Information can be obtained from Winifred Ingersoll, M.D., Acting Director, Student Health Service, University of Wyoming, Laramie, Wyoming.

The following institutions are in need of staff physicians in their student health services:

1. The University of Missouri. The position is a full-time position on a twelve-month's basis, with a month's vacation. Apply to Dan G. Stine, M.D., Director, Student Health Service, University of Missouri, Columbia, Missouri.

2. University of Idaho. The appointment is for ten month. Apply to Harold D. Cramer, M.D., Director, University Health Service, University of Idaho, Moscow, Idaho.

The JOURNAL LANCET

Official Journal of the

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ADDITIONS TO EDITORIAL BOARD

One of the reasons why enthusiasm for the Journal-Lancet is climbing upward in North Dakota medical circles is the appearance of contributions by members of the State Association and news sent in by district secretaries. Many doctors give of their time and thought without any idea of recognition or remuneration. The transactions of the North Dakota State Medical Association, published in this issue, are a further expression of the strides the Association has taken in its sixty-first year. Fortunately for our readers, this unselfishness and scientific zeal is not sporadic but has been the rule for years and promises to continue.

The action of the medical profession of North Dakota is not without effect on our board of editors. It proves that a journal of news and opinion can accomplish much without employment of legislative enactment within a professional group. Invitations from the board of editors have been extended to a number of prominent North Dakota physicians to represent their state as members of the "working press." The many favorable responses have been most heartening. It is anticipated that this additional teamwork will give direction to a more extensive and representative editorial service to the physicians of North Dakota. J. A. M.

HOSPITAL FACTS — 1947

Almost 18 million Americans were admitted into the 6,173 hospitals of the United States in 1947, according to the 1948 American Hospital Directory compiled and published by the American Hospital Association. This represents an average of one of every eight Americans receiving hospital care.

Approximately 16 million patients, two million more than in 1946, were admitted to general hospital during the year, the Directory reports. In addition, 40 million hospital visits were made by outpatients, those needing special tests or treatments without bed care.

The average cost of caring for a patient for one day in a general hospital rose from $9.39 to $11.09 in the year 1946-1947, according to the Directory. Yet the average income from patients was $9.71, leaving a daily deficit of $1.38 per patient to be made up through voluntary contributions and gifts from the public.

Part of the $2,354,344,000 expended by hospitals in 1947 was for the salaries of the 79 fulltime employees serving every 100 patients in all types of hospitals, the Directory states. General hospitals had approximately 151 employees for every 100 patients to maintain prevailing high standards of patient care. Hospitals spent about 400 million dollars more in 1947 than in 1946, because of higher wages, higher prices, and expanded services.

The average patient going to a general hospital in 1947 stayed for only eight days, as compared with 9.1 days in 1946, the figures show. This reflects the spreading practice of entering hospitals in earlier stages of illness, possible for increasing numbers of people through Blue Cross and other prepayment plans, as well as wider recognition of the value of hospitals, improved treatment methods, and early ambulation.

Hospitals in 1947 had total assets of approximately six billion dollars, which is more than $42 for every man, woman and child in the United States. Of that amount, general hospitals' plant valuation represents almost three and a half billion dollars, an average of $7,500 per bed.

"Ten years ago, in 1937, 9,221,517 patients were admitted to hospitals," George Bugbee, executive director of the American Hospital Association reported. "During this ten year span, hospital admissions have increased almost 100 per cent.

"The fact revealed by the Association's survey," he said, "dramatically illustrate the increased recognition of the place of hospitals in the nation's health and welfare."

Medical science and hospital care continue to progress steadily, Mr. Bugbee stated, and added that "while not always as dramatic or as attention-getting as developments in other areas of scientific advance, they do have a personal meaning for every individual in America. The prospect is for better, longer and healthier lives."

. . . MEET OUR CONTRIBUTORS . . .

L. G. Pray, M.D., Fargo Clinic, Fargo, North Dakota, is a previous contributor to Journal-Lancet. He has practiced in Fargo for 7 years; is a graduate of Washington University, St. Louis, class of 1935; specializes in Pediatrics.

Marlin H. Poindexter, Jr., M.D., Fargo Clinic, Fargo, North Dakota, specializes in Pediatrics; has practiced in Fargo for 1½ years; is a graduate of the University of Kansas, class of 1938; diplomate, American Board of Pediatrics; member, Cass County Medical Society, North Dakota State Medical Association, Northwest Pediatrics Society.

Joseph J. Stratte, M.D., has practiced in Grand Forks, North Dakota, for 16 years; specializes in Surgery and Urology; is a staff member of Deaconess and St. Michael's Hospitals, Grand Forks, and Kittson County War Memorial Hospital, Hallock, Minnesota; Consulting Urologist, Good Samaritan Hospital, Rugby, N. D.; Chief of Urology, Deaconess Hospital, Grand Forks; is a graduate of the University of Minnesota, class of 1915; F.A.C.S. (1932); member, Grand Forks District Medical Society, North Dakota State Medical Association, Minnesota State Medical Association.

George M. Lott, M.D., is the Health Service Psychiatrist, Pennsylvania State College; received his A.B. from the University of Michigan, his M.D. from the University of Colorado Medical School.

Edgar S. Krug, M.D., Assistant College Physician, College Health Service, Pennsylvania State College, was a contributor to the May issue of Journal-Lancet.

Herbert R. Glenn, M.D., Director of the College Health Service, Pennsylvania State College, was a contributor to the May issue of Journal-Lancet.

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61st Annual Session

Jamestown, North Dakota, May 22-25, 1948

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C. V. BATEMAN	Wahpeton
F. O. WOODWARD	Jamestown
F. E. WEED	Park River
CHARLES VOGL	Bowman
E. H. RICHTER	Hunter
RALPH DUKART	Richardton

J. N. ELSWORTH	Jamestown
G. R. WALDREN	Cavalier

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W. H. LONG	Fargo
P. G. ARZT	Jamestown
G. W. TOOMEY	Devils Lake

COMMITTEE ON CANCER

L. W. LARSON, Chairman	Bismarck
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COMMITTEE ON FRACTURES

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W. A. LIEBELER, Advisory	Grand Forks
R. B. RADL	Bismarck
M. S. JACOBSON	Elgin
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COMMITTEE ON CRIPPLED CHILDREN

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D. W. MATTHAEI	Fessenden

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COMMITTEE ON INDUSTRIAL HEALTH

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H. E. GULOIEN	Dickinson
J. P. CRAVEN	Williston
JOSEPH SORKNESS	Jamestown

REFERENCE COMMITTEES

To consider the Reports of the President, Secretary and Special Committees with the exception of the Committee on Emergency Medical Service:

A. R. SORENSON, Chairman	Minot
W. W. WOOD	Jamestown

To consider the Reports of the Council, Councillors, Delegate to the A.M.A., and Member of the Medical Center Advisory Council:

D. J. HALLIDAY, Chairman	Kenmare
W. H. GILSDORF	Valley City

To consider the Reports of Standing Committees:

R. E. LEIGH, Chairman	Grand Forks
H. B. HUNTLEY	Kindred

To consider the Reports of the Committee on Medical Economics, including the Sub-Committees on Veterans Medical Service and Rural Health:

J. D. CRAVEN, Chairman	Williston
R. B. RADL	Bismarck
E. J. SCHWINGHAMER	New Rockford

To consider the Report on Prepayment Medical Care:

R. W. RODGERS, Chairman	Dickinson
W. R. FOX	Rugby
T. Q. BENSON	Grand Forks

To consider the Report of the Committee on Emergency Medical Service:

A. C. FORTNEY, Chairman	Fargo
C. C. SMITH	Mandan
V. D. FERGUSSON	Edgeley

Committee on Resolutions, to include New Business:

C. J. GLASPEL, Chairman	Grafton
O. A. KNUTSON	Buxton

Committee on Credentials:

W. W. WOOD, Chairman	Jamestown

Nominating Committee:

O. A. SEDLAK, Chairman	Fargo
C. J. MEREDITH	Valley City
J. C. FAWCETT	Devils Lake

Proceedings of the House of Delegates of the NORTH DAKOTA STATE MEDICAL ASSOCIATION

First Session, Saturday, May 22, 1948

The First Session of the House of Delegates was called to order by the Speaker of the House, Dr. A. P. Nachtwey, at 8:00 P.M. in the Dining Room of the Gladstone Hotel, Jamestown, N. D., Saturday, May 22, 1948.

Dr. W. W. Wood, chairman of the Committee on Credentials announced that seventeen delegates had presented their credentials and were qualified. Dr. Nachtwey announced that Dr. Fox was present as an alternate for Dr. Toomey of Devils Lake, and that the only district not having a delegate present was the Richland County District Medical Society. It was moved by Dr. A. R. Sorenson, that the chair appoint a delegate from the Association to represent the Richland County District Medical Society, which motion was seconded by Dr. D. J. Halliday and passed. Accordingly, Dr. E. J. Larson of Jamestown was appointed to represent the Richland County Medical Society.

The Secretary, Dr. Sedlak, called the roll and the following responded: Drs. A. C. Fortney, Fargo; H. B. Huntley, alternate, Kindred; W. R. Fox, alternate, Rugby; R. E. Leigh, Grand Forks; T. Q. Benson, Grand Forks; C. J. Glaspel, Grafton; J. D. Craven, Williston; A. R. Sorenson, Minot; D. J. Halliday, Kenmare; W. H. Gilsdorf, Valley City; R. B. Radl, Bismarck; C. C. Smith, Mandan; V. D. Fergusson, Edgeley; R. W. Rodgers, Dickinson; W. W. Wood, Jamestown; E. J. Schwinghamer, New Rockford; O. A. Knutson, Buxton; E. J. Larson, alternate for Richland County District Medical Society, Jamestown. The Speaker declared a quorum present.

Minutes of 1947 Meeting Approved

On motion of Dr. W. W. Wood, seconded by Dr. A. C. Fortney, and carried, the reading of the minutes of the 1947 session as published and circulated in the September 1947 issue of the JOURNAL-LANCET were dispensed with and the minutes adopted.

Introduction of President

The Speaker introduced the President, Dr. P. G. Arzt, who welcomed the delegates to the convention and delivered the following address:

"It is indeed a pleasure for me to formally welcome you at this, your first business meeting in the Convention City. It is an added pleasure inasmuch as this is my home town.

I trust all will have a wonderful time, that you combine business with pleasure and that you will be guided by the dictum 'from labor to refreshment'.

Realizing full well that your labors will be stupendous and that you will be called upon to exercise the keenest judgment, and that your decision must be based upon the premise of equity and justice to all—it is apparent you have one very hard job. May the wisdom and judgment of Solomon prevail.

I told you at the Fargo meeting I was not fearsome for the reason that we had a most efficient executive secretary who was doing an outstanding job and would be a sheet anchor to windward. I have not been disappointed; trial and error has been held to a minimum.

The various committees have done an amazing work. No task has been too difficult; all has been accomplished with an earnestness and faithfulness unsurpassed by any group of men I have ever known. The Handbook only partially reveals the activities of the past year.

During the regime of my predecessor, a resolution was passed by the House and Council authorizing the organization of a Woman's Auxiliary to this Association. The organization of the Auxiliary was completed at the Fargo meeting through the efforts of Mrs. Leo Schaeffer, second vice-president to the National Auxiliary. Subsequently, the House of Delegates suggested the appointing of an Advisory Council to the Auxiliary. To this council I thought best to appoint the active officers of the State Association, namely the President, Secretary and Treasurer, together with the executive members of the Council, McCannel, Sorkness and Waldschmidt. I would further recommend that the councillor residing in the district of the President of the Auxiliary be a member of this Advisory Council.

The ladies of the Auxiliary have surely been diligent and have developed a perfectly functioning local council in every district of the Association, excepting Richland and Kotana—a truly remarkable record compared with other states. They now have a membership of 165. Their goal is to have all districts organized and to equal in membership the membership of the State Association to which they are Auxiliary. In reaching this goal the councillors of the two districts already mentioned should very definitely help in the organizational effort.

These officers have all worked hard; no effort has been too great to accomplish their goal—a complete functioning auxiliary. I would recommend that the House of Delegates send a resolution of commendation to the Auxiliary in recognition and appreciation of their accomplishments.

I would reiterate the recommendation of Dr. Hanna that the president-elect and vice presidents participate more actively in Association affairs. Dr. Wright in 1947 recommended the formation of a State Health Council composed of inter-allied professional groups. This might well be attempted.

It has been the custom of the Governor to appoint the incoming president to the State Health Planning Committee. This arrangement seems to me to be a waste of effort as it takes about a year to know what it is all about. I suggested the reappointment of Dr. Spear, a most capable representative and a man who was conversant with all the details. The Governor agreed with this arrangement. I would suggest that this be continued if the genial Doctor is willing to carry on.

The report of the Committee on Medical Education submitted by Chairman French is very illuminating. Indicating a complete discussion of the entire subject, bringing out the possibilities and advantages to the State of a well-supported and successfully operated and maintained four year School of Medicine, but recognizing the futility of such procedure until the new Science building is completed and the laboratory sciences are strengthened and this attempt to regain full recognition by the rating bodies of the A.M.A. This to me seems a most wise decision. I note and quote from the report 'that even with the budget of this biennium better than before, and the prospect of the new building, the status of the School is still critical'. It was felt that the mill levy amendment soon to be voted upon should be passed, that a rigorous campaign of education should be put on to this end, and that the State Association might well make an appropriation to further such a campaign.

That brings me to a companion report submitted by Dr. John Moore, member of the Medical Center Advisory Council. I shall not go into detail as you have the splendid complete picture in the report of Secretary Engebretson and Mr. John A. Page of January 16, 1948, and the explanatory remarks of Dr. Moore in his report. Dr. Moore ends his report, and again I quote, 'The North Dakota State Medical Association has officially endorsed this program on numerous occasions. I now urge each individual physician to actively work for a "Yes" vote on the proposed constitutional amendment next November'.

There you have the picture. Are we going to complacently sit on our hands and do nothing as we have for twenty years, when we let Dr. French carry the load, or are we going to get up on our hind legs, put this proposition across, strengthen our laboratory sciences and whatever else may be necessary to regain full recognition and then go on to larger fields? If I know my medical conferees, their decision will be, 'We will put this across'. With that thought in mind, I would suggest a state-wide committee be formed, the present Committee on Medical Education and those members of the Medical Center Advisory Council to be the nucleus; further, that the State appropriate whatever may be deemed necessary and expedient. This means work and it will not be easy.

I purposely have omitted mention of the report of the Economics Committee, especially the painstaking report of the Prepayment Medical Care Committee, as this must necessarily mean a campaign of education. The strength of any organization is directly proportionate to the *unity* thereof. Loss of interest is engendered by nonrecognition. 'Work me or lose me', is a truism and applies particularly to members who have attended meetings for years without recognition of their probable capabilities. It is a difficult job for the incoming president to name the component members of the various committees. It might be well for the Councillors or president of the district society to report capable prospective committee men to the President. This should be done to keep up interest.

The Association has enjoyed an enviable and prosperous year. I truly can say I have enjoyed being of service. The ending is all too soon. I again wish to commend the various committees for their painstaking devotion to the job. The Handbook shows the result of their labor.

I wish to again express my sincere appreciation and thanks to Executive Secretary Engebretson for his timely and efficient assistance at any and all times. He was like a beacon in a storm.

Gentlemen, I thank you."

The Speaker then referred the report of the President to the Reference Committee on Reports of the President, Secretary and Special Committees.

The Speaker then introduced the new delegates, who were delegates for the first time. They were Drs. Huntley, Fortney, Leigh, Benson, Gilsdorf, Radl and Rodgers.

Report of the Secretary

Dr. O. A. Sedlak, Secretary, presented the following report as prepared in the Handbook, which was referred to the Reference Committee on Reports of the President, Secretary, and Special Committees. This report includes the report of the Executive Secretary which was likewise referred to the same reference committee.

The duties of the Secretary as outlined in the Constitution and By-Laws of the North Dakota State Medical Association have been broadened so greatly during the past few years that today it is impossible for an active practitioner to fulfill them. We have an Executive Secretary, without whom I am sure I would have been a miserable failure as secretary of your society. His report will give you only a small idea of the enormous amount of work which has been taken away from the elective office. I sincerely hope that the office of the executive secretary remains a permanent office in our organization.

Membership: The total membership for 1947 was 350. Of this number 342 paid their annual dues, and 8 were honorary members. Four members died during the past year and five of those who paid dues in 1946 did not pay their 1947 dues. It is very gratifying to know that 28 new members were admitted to the Association during this past year.

Table 1 shows the annual membership for the last eight years. You will note that in 1943, 61 dues had been cancelled because of military service, bringing the total membership up to 403. That same year the paid-up membership was 331. In 1947, we have exceeded the paid-up membership of 1943, which was the heaviest year of drain on the membership due to military service. A considerable number of the physicians who left North Dakota for military service have returned. A number of entirely new men have come into the state. Of course, during the years between 1942 and 1947 a number of physicians have retired or died. The last year's growth therefore indicates a healthy growth and the trend should continue for a number of years to come, provided it will not be necessary to again draft physicians into the military service.

Table 1

Comparison of Annual Membership

	1940	1941	1942	1943	1944	1945	1946	1947
Paid Memberships	387	374	366	331	318	313	322	342
Honorary Memberships	11	12	10	11	10	9	9	8
Dues Cancelled— Military Service	—	14	32	61	59	57	4	—
	398	400	408	403	387	379	335	350

Table 2 shows that the annual dues for 1948 are being paid quite promptly. Twenty-eight new members have been admitted this past year. They are included in the total of 321 paid-up memberships. A study of the records indicates that several members who are in active practice have failed to pay their current dues. The district medical societies and the Councillors should use every means possible to collect the dues of these delinquent members.

Table 2

	May 5	April 20		May 5		May 1	
	1942	1943	1944	1945	1946	1947	1948
Paid-up Members	352	316	304	294	305	316	321
Honorary Members	10	10	10	9	9	8	6
Dues Cancelled— Military Service	31	58	59	57	?	0	0
	393	384	373	360	314	324	327

Field Work: Your Secretary has not been able to visit any of the district societies during the year. Your Executive Secretary, however, has visited various district societies and has contributed much toward a better understanding between local and state levels of medical activities.

Your Secretary tried to establish new contacts, especially in regional and national levels. He attended the annual convention of the state secretaries which was held at the American Medical Association headquarters last October and also the meeting of the North Central Medical Conference at St. Paul. He attended the second annual meeting of the AMCP in St. Louis in September. The Associated Medical Care Plans, or AMCP as it is commonly known, is an organization of voluntary plans for the pre-payment of medical care. It is non-profit in nature and has been formed to assist these plans in their internal and inter-plan problems. It is purely a service bureau with power only to suggest, the actual control will always remain with the individual plan. Problems are becoming so complex and wisdom gained through experience becomes too costly, so the AMCP was formed to serve as a clearing house so that all may gain by the sad experiences of others and profit by their wisdom. The dangers of a merger of the Blue Cross and the Blue Shield are all imaginary and whether or not they materialize should not deter one from obtaining all the benefits AMCP has to offer.

Committees: The report of the committees as presented in the handbook indicate their activities during the year. As usual, the bulk of the work has fallen on the Committee on Medical Economics.

RECOMMENDATIONS

1. In the Executive Secretary's report, mention is made regarding budgetary authorizations for various expenses which have become very important to the smooth functioning of the Association. This matter should receive careful consideration and some definite action should be taken.

2. An amendment to the dues section of the By-Laws should be made. "Whereas it is considered that there is some abuse of the provision in Chapter IX, Section 6, relating to the assessment of dues for out of state members and whereas it is felt that some members falling within this category are utilizing their membership while permanently out of the State of North Dakota because of the fact that they are unable to become members of the Medical Association in the state in which they have located; now, therefore, it is recommended that Chapter IX, Section 6, be amended to read as follows: 'The annual assessment for resident members who have retired from practice of medicine and non-resident members *who have retired or who do not stay outside of the State of North Dakota for a period in excess of two years* shall be $10.00 per capita unless otherwise ordered by the House of Delegates'."

Conclusion: I wish to thank all those who have cooperated with me during the past year in the affairs of the State Association. This has been my first year as Secretary, but with the help of President Arzt, Willard Wright as Chairman of the Committee on Medical Economics, and our capable Executive Secretary, Mr. E. Forsyth Engebretson, the year's work has been a great pleasure to me instead of being just another chore.

Executive Secretary's Report

It is again my decided pleasure to make this report covering my activities with the Association. The report will be made in paragraphs for the convenience of the House of Delegates and the reference committees who will consider the report.

1. *General*: The State Office staff remains substantially the same as last year and is housed in the same and very adequate location. One important change has been made in personnel.

Mr. Samuel Gurke took over the important post of director of the North Dakota Veterans Medical Service Division which was vacated by Mr. Richard Penwarden, who took a construction job in the territory of Alaska. In the Executive Secretary's office we have the very able secretary, Miss Rhea McDonald, in addition to the Executive Secretary. Mr. Gurke has one full time and one part time stenographer.

Our office equipment is in excellent condition. The major addition is a dictaphone machine which has effected a considerable saving in time. At present the office is equipped to give such service to the members, officers, committee members and others who have occasion to call for service, as limited personnel will permit.

2. *Meetings*: The Executive Secretary has attended the various meetings of the Council, committees having to do with socio and medical economics, such as Committee on Medical Economics and its sub-committees on Veterans Medical Service, Rural Health and Prepayment Medical Care. He has also attended the committee meetings of those committees, the activities of which are closely connected with the broader aspects of Public Health, such as the Crippled Children, Maternal and Child Welfare, Venereal Disease, Tuberculosis and Public Health Committees. He has attended with the most pleasurable company of Dr. A. E. Spear, the meetings of the Governor's State Health Planning Committee and meetings of various nurses groups. It has been a pleasure to note the conscientious business-like way in which all of these groups carried on their work. While the Executive Secretary has not attended the meetings of committees whose function it is to deal with the scientific aspects of medicine, their reports in this handbook evidence the same high quality of purpose.

In the regional and national field, your Executive Secretary has attended the AMA's National Veterans Medical Service Conference, its Conference on Rural Health, its Secretarial Conference and Conference on Medical Care, and the very worthwhile North Central Conference sponsored by the Council on Medical Service. He also attended the Annual Economics Meeting of the NPC. In this respect it should be noted that the doctors from this Association who represent the NDSMA and attend these meetings are held in the highest of esteem.

He has also visited various North Dakota District Medical Society meetings in response to invitations from such societies, but regrets that he has not visited each one during the past year.

3. *Financial*: The annual financial report, as is customary, has been made to the Council, but a matter of finance which will affect the future activities should be placed before the House of Delegates at this time. This is but the second year of experience with a full time state office. In earlier years it was customary to make small budgetary authorizations for: (1) expenses of the President; (2) of the Chairman of the Council; (3) of the Chairman of the Committee on Medical Economics; and (4) the Delegate to the AMA. At the meeting of the Council last year the allotments were raised somewhat. They still will not cover the out-of-pocket expenses of the doctors doing this work. Quite often in the past, even the small amounts authorized were not used, as the doctors concerned often paid all of their expenses out of their own pockets. Such a custom was not good practice nor should it be followed in the future. However, attention must be called to the fact that the annual budget for the last two years has been set at a figure as high as is reasonably commensurate with annual income. It seems to become increasingly necessary for members to represent the Association at national meetings. This too is a healthy situation and the practice should be expanded rather than curtailed. The question as to where the money shall come from, however, cannot long be avoided. Further, while it possibly is not necessary it certainly would be a nice gesture to be able to treat officers and committeemen who are called together for statewide meetings covering the business of their office or committee to a dinner function while attending such a meeting. As a method of holding the group together between afternoon and evening sessions, such a dinner is of practical merit. The annual income at present is sufficient to carry on the state office activities as they now exist, together with an inadequate amount expendable towards the reimbursement of representatives who travel on official business of this Association. While it is probably not necessary that any final action be taken at this time, consideration should be given toward a realistic policy in the compensation of expenses of members of this Association when engaged in official business of the organization. This should not be done, however, simply by voting the appropriation, but an examination of the income and dues structure will be necessary.

4. *Woman's Auxiliary*: High on the list of accomplishments during the last year will be rated the success of the officers of the Woman's Auxiliary. Under the most effective leadership of its President, Mrs. Annabel K. Arzt, this group has succeeded in its organizational job throughout the state in a single year. But one district, the Richland County District Medical Society, is unorganized at the time of this writing. Your Executive Secretary recommends that a resolution of commendation be adopted by this House of Delegates.

5. *Unauthorized Expenditure of Funds by Federal Employees:* It is hoped that far reaching and lasting effects may come from the work of the Harness Congressional Committee. This committee has made an able and thorough investigation of the use of federal monies by some federal employees who seek to create artificial pressure in Congress for measures they favor. Among these measures involving such misuse of funds was the Wagner-Murray-Dingell bill. The method utilized by these employees was thoroughly documented by the official files of the planners themselves and showed an intent to build pressure upon Congress through grass roots conferences. Your Executive Secretary experienced one of these "grass root conferences" within this state and reported on the same. He saw 19 employees of the federal government carry out the activities of the master plan. He testified before the Harness Committee in Washington corroborating the fact that these employees had actually sought to carry out the master plan of pressuring Congress into enacting legislation which would mean the socialization of medicine. This group of federal employees has been named by Representative Harness "Washington's most dangerous lobby." Through the nationwide publicizing of the findings of this committee our country has been alerted to the danger emanating from this group who, while employed by the executive department to administer the laws promulgated by Congress, use taxpayers money and their official position to accomplish the passage of legislation to suit their own purpose.

6. *Annual Session*: Your Executive Secretary wishes to express his appreciation to the members and committeemen of the Stutsman County District Medical Society with whom he has worked in connection with the 1948 Annual Meeting. He wishes to call attention to the technical exhibits for which the exhibitors pay rentals which in great measure defray the cost of the session. Members are urged to visit these exhibits whenever intermissions are held and show their appreciation to the exhibitors and their representatives.

7. The Executive Secretary wishes to express his personal appreciation to all with whom he has had occasion to work during the last year. The NDSMA is *your* Association. To be both alive and democratic requires participation by all members in its activities. Let us all resolve to take an ever increasing interest in its affairs.

E. F. ENGEBRETSON, Executive Secretary

Report of the Treasurer

Dr. E. J. Larson, Treasurer, presented his report as published in the handbook:

Balance on hand, May 1, 1947		$ 8,484.81
RECEIPTS:		
Receipts from dues	$11,465.00	
Interest on bonds	112.50	11,577.50
Total Receipts		$20,062.31
DISBURSEMENTS:		
Checks No. 535 to No. 549, inclusive, covering vouchers No. 1 to No 15, inclusive:		
7-11-47—Newberry Insurance Agency, Treasurer's bond	$ 9.10	
Dr. W. W. Wood, exp., treas.	30.00	
Veterans Med. Service, Vet. Med. Serv.	1,000.00	
State Medical Assn., Office Exec. Secy.	1,500.00	
8-25-47—Mrs. Fae Byrne, Steno Services	150.00	
State Medical Assn., Office Exec. Secy.	2,500.00	
10-23-47—North Central Med. Conf., 1947 dues	50.00	
10-29-47—Dr. A. P. Nachtwey, Delegate Expenses	175 00	

12-4-47—Dr. W. A. Wright, exp., Chrm. Med. Econ.	150.00	
Dr. R. B. Radl, exp. Chicago VA meeting	83.40	
12-5-47—JOURNAL-LANCET, Subscriptions	684.00	
12-24-47—State Medical Assn., Office Exec. Secy.	2,000.00	
2-12-48—Dr. J. H. Moore, exp. Interim meeting	152.50	
4-30-48—State Medical Assn., Office Exec. Secy.	1,500.00	
Dr. A. E. Spear, exp. President	430.59	
Total checks issued	$10,414.59	
Bank exchange	1.20	
	$10,415.79	$10,415.79
Balance, April 30, 1948		$ 9,646.52
Bonds		4,500.00
Total Assets, April 30		$14,146.52

Recapitulation of Bank Balance

4-30-48—Balance, James River National Bank		$11,577.11
Outstanding checks:		
No. 548	$ 1,500.00	
No. 549	430.59	1,930.59
4-30-48—Balance		$ 9,646.52

Report of Chairman of the Council, 1947-1948

Dr. A. D. McCannel, Chairman, presented the following report, which was referred to the Reference Committee on Reports of the Council, Councillors, Delegate to the American Medical Association, and Member of the Medical Center Advisory Council.

During the past year the Council of the North Dakota State Medical Association met four times. Three of these meetings were held in conjunction with the 1947 Annual Meeting of the Noth Dakota State Medical Association, and one, an interim meeting, was held in Bismarck in December 1947. The following reports were made and action taken at the May meetings:

Reports: Dr. Spear, President of the Association, addressed the Council, outlining the high spots of the work of the Association for the past year. He highly complimented the Council upon its very fine work.

Secretary L. W. Larson made reference to his report which was printed in full in the Handbook for the House of Delegates. He further reported on the meeting of the AMA Committee on Rural Health from which he had just returned.

Treasurer W. W. Wood made his financial report by reference to the Treasurer's Report also printed in full in the handbook.

Mr. E. F. Engebretson read the Financial Report of the Office of the Executive Secretary and the Office of the North Dakota Veterans Medical Service Division, copies of which follow:

ACCOUNT OF OFFICE OF EXECUTIVE SECRETARY

June 1, 1946, to April 30, 1947
(Estimated Expenses April 30 to May 31, 1947)

Total Receipts from Treasurer		$11,500.00	
Total Receipts—Commercial		1,225.00	
Total Receipts—Other		4.25	
Balance, April 30	$3,263.65		
Total Expenditures, June 1, 1946 to April 30, 1947			$9,465.60

BREAKDOWN OF EXPENDITURES TO APRIL 30

	Expenses	Vet. Div.	Educ.	Conv.	NDSMA Actual	Budget
Salary, Executive Secretary	$ 2,704.43	$	$	$	$2,704.43	$3,500.00
Salary, R. H. Penwarden	285.30	285.30				
Rent, office (6 months)	225.00	50.00			175.00	600.00
Lights, Office (5 months)	8.06				8.06	50.00
Telephone and telegraph	160.12	12.20	25.80	1.10	146.82	125.00
Salary, Stenographer	1,177.20				1,177.20	1,800.00
Stationery and office supplies	(382.53	(27.64			(354.89	400.00
Postage	(160.63	(21.00			(139.63	
Commercial service	32.25		4.56		32.25	
Post Office box rent	8.44				8.44	
Freight, express, cartage	5.13				5.13	
Equipment and office furniture	438.20	15.00			423.20	
Mimeograph	69.47				69.47	
Janitor service (4 months)	35.00	5.00			30.00	
Cleaning supplies	6.77				6.77	
Repair typewriter	14.71				14.71	
Advertising (Stickney Ads)	23.70				23.70	
Expenses, Secretary Larson	42.40				42.40	
Dues and subscriptions	75.75				75.75	
Travel expenses	719.31	231.34		62.04	487.97	1,000.00
Bond, Executive Secretary	31.25				31.25	
Insurance, equipment and furniture	17.48				17.48	
Withholding tax	342.30				342.30	
Social Security withheld	42.67				42.67	
Social Security matched	42.67				42.67	
Miscellaneous	2.00	2.00				
January conference expenses			29.68			
Cash to E. F. Engebretson			40.30			
Extra Steno service			15.00			
Legislative reports			65.00			
Total			$180.34			
Education fund	500.00					
Amount to Veterans Division	2,500.00	2,500.00				
Total	$10,115.08	$3,149.48	$180.34	$63.14	$6,402.46	
Refunds	649.48	649.48	319.66			
Total Expenses through April 30	$ 9,465.60	$2,500.00	$500.00	$63.14	$6,402.46	
Estimated Expense for May	915.15				915.15	
Total to May 31 (est.)	$10,380.75				$7,317.61	$7,475.00

Permanent Furniture:		Total Value of Furniture Purchased Before This Year
Stenographic chair	$ 32.72	
Stenographic desk	107.10	
Executive desk	137.70	
Side arm chairs (4)	85.68	
Office rugs and curtains	60.00	
Total Cost	$ 423.20	$73.50
Less 10% depreciation	42.32	7.35
	$ 380.88	$66.15

This does not reflect an entirely accurate picture as for the first six months we were not operating in our present location; neither did we have a complete staff from the start.

No stenographer for month of June—reduced cost	$ 150.00
No office rent for six months	300.00
Travel reduced	512.03
Total of Reduced Costs	$ 962.03
Total NDSMA Actual Expenses	$7,317.61
Normal Total Expenses, June 1 to May 31	$8,279.64

Budgetary Items which may be reduced for 1947-1948:

Rental (dividing with ND Vet. Med. Service)	$300.00
Janitor (dividing with ND Vet. Med. Service)	60.00
Lights (dividing with ND Vet. Med. Serv.)	7.92
Furniture	423.20
Total of items which may be reduced	$791.12

In order to prepare a budget which will permit no more activity than we undertook last year the total of items which may be reduced should be subtracted from the normal expenditures for last:

Normal Expenditures last year	$8,279.64
Total of items which may be reduced	791.12
Total Normal Budget	$7,488.52

You will note that your Executive Secretary has spent only a portion of the budgetary item allowable for transportation. This has been done in an attempt to keep the expenses of the Association as close to the income as possible. Early in the year it was apparent that (1) the purchase of permanent fixtures, (2) the inadequacy of the budgetary item "Office Supplies, Postage" and, (3) the expenses incidental to the establishment of the North Dakota Veterans Medical Service Division, would create a severe drain on the resources of the Association. We have therefore attempted to put first things first. Your Executive Secretary has not traveled as much as he ought to have traveled for these reasons.

The North Dakota Veterans Medical Service Division has so far drawn $4,000.00 for operating expenses. The Division, after two months operation is just starting to show income. We are hopeful that we will not have to make further withdrawals from the Treasury and that soon the Division will be in a position to commence repayments on this advance.

Veterans Medical Service

Trial Balance — January 1 to May 31, 1947

	Debit	Credit
Veterans Administration Center	$3,532.10	
Medical Accounts payable		$3,211.00
Income—contract fees		471.60
First National Bank—May 31, 1947	220.04	
Old Age Benefit (2nd quarter only)		8.80
Withholding Tax (2nd quarter only)		39.80
Salaries and wages	1,615.00	
Printing	39.60	
Postage	133.93	
Office Supplies (inc. Manuals of Info.)	757.08	
Rent	100.00	
Power and Light	1.33	
Telephone and Telegraph	33.90	
Furniture and Fixtures	958.14	
Miscellaneous (cleaning, bond, litebulb, keys, labor)	85.43	
Insurance (old age benefit paid)	7.35	
Travel	247.30	
North Dakota State Medical Association		4,000.00
Totals	$7,731.20	$7,731.20

The Auditing Committee of the Council reported that the accounts of the Secretary, Treasurer, Executive Secretary and Director of the North Dakota Veterans Medical Service Division had been examined and found to be correct. This report was approved by the Council.

The Council recommended that the different local societies accept the recommendation of our President, Dr. Spear, to organize a Woman's Auxiliary. (It is my pleasure to report at the present time that the entire state has been organized within the year, with the exception of the Richland County Medical Society. It is hoped that the organization will be completed in this district within a short time. A great deal of credit should be given to the officers of the Woman's Auxiliary under the leadership of Mrs. Annabel K. Arzt for having accomplished this very fine job.)

Mr. E. F. Engebretson explained the reasons for three proposed amendments to the By-Laws. It was moved, seconded and carried that the three proposed amendments be recommended by the Council to the House of Delegates for passage.

It was moved, seconded and carried, that program committees for future annual meetings should allocate at least 25% of the programs to the members of this Association and that that committee should be authorized to designate local men to make up 25% of the program if volunteers were not sufficient.

The resignation of Dr. A. E. Westervelt of Bowdon, Councillor of the Ninth district was approved.

Dr. W. W. Wood, Treasurer of the Association for 25 years, explained that he would like to be relieved of his burden because of increased press of duties put upon him by his practice. Chairman of the Council, Dr. N. O. Ramstad, in response to the Treasurer's remarks, stated that the Association was very grateful to the Treasurer for the long and faithful years during which he performed his duties, and thanked Dr. Wood for his good work on behalf of the Council.

The Council approved the expenditure of $430.59 to compensate President A. E. Spear for his expenses incurred during the past year.

At the close of the second session of the Council, which was the last meeting for the old Council, fine tributes were paid to Dr. N. O. Ramstad, who has been the very efficient chairman of the Council for many years. Dr. Ramstad stated that he did not wish to be considered for re-nomination to the Council and thanked all Council members for the very fine cooperation they had given him in the past.

At the third session of the Council, upon reorganization, Dr. A. D. McCannel was elected Chairman of the Council.

Report was made by Dr. R. B. Radl, Chairman of the Sub-Committee on Veterans Medical Service, covering the operations of the Veterans Medical Service Division, which report was followed by a very considerable amount of discussion.

Drs. R. H. Waldschmidt, Bismarck; A. D. McCannel, Minot; and Joseph Sorkness, Jamestown, were appointed as an interim committee specifically for the purpose of re-negotiating a contract with the Veterans Administration; further to act as a general executive committee for the Council.

The Council voted an indefinite appropriation for the payment and reimbursement of the expenses of Dr. W. A. Wright, Chairman of th Committee on Medical Economics incurred during the past year in representing the Association on official business.

The Council was very pleased with the work done by the Executive Secretary, Mr. E. Forsyth Engebretson, during the past year and at his request granted him the privilege of doing some outside work with the legal firm he was formerly associated with.

The following budget for the new year was prepared and approved by the Council:

BUDGET

North Central Conference	$ 50.00
Committee on Medical Economics	100.00
Stenographer for Annual Meeting	150.00
Emergency Fund for Chairman of the Council	50.00
Emergency Fund for the Council	200.00
A.M.A. Delegate	250.00
JOURNAL-LANCET	750.00
Travel Expenses for the President	300.00
Budget Set Up for Office of Executive Secretary	
Salary, Executive Secretary (Medical Examiners Board to make up difference of $1,000.00)	3,500.00
Rental of office	300.00
Lights	25.00
Telephone	75.00
Office Supplies and Postage	525.00
Stenographer	2,100.00
Travel Expense of Executive Secretary	1,000.00
Total Budget	$9,375.00

The executive committee was delegated all powers in negotiating with the JOURNAL-LANCET and further power to select an editorial committee.

At the interim meeting of the Council in December, the Council took the following action. After a report and explanation by Dr. W. A. Wright, Chairman of the Committee on

Medical Economics, reporting the renegotiation of a new contract with the Workmen's Compensation Bureau, and after a report and explanation of the present status of the Veterans Home Town Care Program, did adopt the report of the Committee on Medical Economics.

A considerable discussion was carried on between the members of the Council and officials of the North Dakota State Welfare Department relative to a new limitation policy in connection with old age assistance cases. It was apparent because of the unavailability of funds that the department found it necessary to put a $60.00 maximum limitation for the care of each old age welfare client per month. The first claim on this sum of money is that amount necessary to pay for the subsistence of the client. The difference between the amount required for subsistence and the maximum of $60.00, is available for medical and hospital expenses, and the difference between the two sums may be accumulated for six months. While it was the concensus of opinion of the members of the Council that this would cause some friction and hardship between doctors of the Association working under this program and possibly some county welfare boards who, because of the limitation, would have to assume additional financial burden not shouldered by them before, it was nevertheless decided to cooperate as fully as possible with the State Welfare Department, and it was recommended that the NDSMA accept the new method of payment temporarily. Dr. Wright advised that the Committee on Medical Economics had under consideration revised fee schedule with the State Welfare Board.

Representatives of the Journal-Lancet, *South Dakota Medicine* and *Minnesota Medicine* appeared before the Council with proposals and invitations to participate in the respective journals. After presentations by representatives of these journals and considerable discussion on the part of the members of the Council, it was decided to suspend any action until the next meeting of the Council and if no decision was made at that time, the House of Delegates ought to be asked their opinion as to which should be designated the official journal of the NDSMA.

The Council, upon inquiry from Dr. F. L. Wicks, was of the opinion that the custom of presenting full obituary notices in the Handbook be continued.

A. D. McCannel, M.D., Chairman

As a supplementary report of the Chairman of the Council, Dr. Glaspel, its secretary, presented the following recommendations to the Speaker, which supplementary report was referred to the Reference Committee to Consider the Report of the Council, Councillors, Delegate to the American Medical Association, and Member of the Medical Center Advisory Council:

"That the House of Delegates give careful study to the needs of increasing the annual dues to $50.00 per year, due to the fact that the demands of our budget are greatly increasing; this increase being due to the travel expenses of members of various committees and the fact that there will be an increased expense in connection with the coming legislative session. The annual registration fee of $3.00 at each convention will be eliminated.

"That the House of Delegates give their earnest study to the recommendations of the Committee on Prepayment Medical Care.

"That the contract with the Journal-Lancet be renewed for one year, provided that this is aceptable to the Journal-Lancet.

"That the annual assessment for resident members who have retired from the practice of medicine, and non-resident members who have retired and who do not stay outside of the State of North Dakota for a period in excess of two years, shall be $10.00 per capita, unless otherwise ordered by the House of Delegates."

REPORTS OF COUNCILLORS

The following reports of the Councillors, as published in the Handbook, were referred to the Reference Committee on Reports of the Council, Councillors, Delegate to the American Medical Association, and Member of the Medical Center Advisory Council:

First District

The following is a resume of the proceedings of the Cass County Medical Society for 1947 as submitted by Dr. John H. Bond, Secretary.

Eight regular meetings were held during 1947. The meetings were preceded by dinner, following which the members and guests enjoyed programs of scientific and economic subjects of common interest to all. Many interesting programs were presented. Outstanding were the papers presented by Dr. Harold Buchstein, neuro-surgeon from Minneapolis, on "Surgical Treatment of Hypertension," "Functional Diseases and Marital Conflicts," presented by Dr. Challman, psychiatrist from Minneapolis, and the program given by Dr. Pickoff of Winnipeg on "Diseases of the Liver, Gallbladder and Common Duct Diseases."

In September, 1947, Dr. O. A. Sedlak, State Secretary, gave us a report on the activities of the State Medical Association. The new dean of the North Dakota Medical School, Dr. A. H. Lawton, was introduced and he gave a resume of the goals of the Medical School. Our President, Dr. P. G. Arzt, was invited but was unable to attend the September meeting.

The attendance of all meetings was good. Throughout the year guests from surrounding local societies and the medical staff of the Fargo Veterans Hospital attended our meetings.

Dr. F. L. Hewes, Dr. G. A. Dodds and Dr. J. A. Baird were elected to full membership in the Society.

Five additional physicians were put on the probation list for one year. The Cass county membership now numbers fifty-two.

The Society contributed to the local Cancer Fund, and in December of 1947, the new officers were elected: President, Dr. B. M. Urenn; vice president, Dr. Charles Heilman; secretary-treasurer, Dr. John H. Bond; board of Censors, Dr. W. F. Nichols; delegates, Drs. Dillard and Fortney; alternates, Drs. Fjelde and DeCesare.

The North Dakota State Meeting was held in Fargo in May, and from all reports, was a successful meeting.

The following is a report on the Richland County Medical Society: I regret to inform the Council no regular County Society meetings were held during 1947. The Society membership consists of seven active members. One member moved out of the state during the year.

The Staff meetings held each month at the St. Francis Hospital at Wahpeton, North Dakota, brought the membership together for scientific medical discussions. Many of the society's members attended meetings of the Cass County Society during the year.

James F. Hanna, M.D., Councillor

Second District

The Devils Lake District Medical Society can definitely report upward trend, expected following the war years, in type of meetings, programs, and membership present. Interest in meetings has been greatly improved, and more outside speakers on the programs as well as papers from local men. Although there have been a few of the older and more inactive men that dropped out of the Society since the dues were raised, I believe, on looking the names over, that these were men who would very likely have dropped out anyway from lack of interest as their activity in practice has decreased.

During the war years, largely due to fewer men being much more tied down than usual, we only averaged about three and occasionally four meetings a year, with poor attendance. During the past year we had six meetings, that is one every second month. Attendance has been very good and interest increasing. The younger men are taking an increasing interest in the society and membership among the younger men has been 100 per cent. There has been considerable interest shown at meetings by this society in medical service plans for some type of medical service, and the society went on record as favoring a type of medical service plan as soon as feasibly possible.

The total number of paid active members of the Devils Lake District Society for 1947 was 19. There is one honorary life membership. For 1948 there will be one, and possibly two members that will change from the active to the retired status. Nineteen forty-eight will also see the addition of three new active members, being young men recently starting practice in the district.

John C. Fawcett, M.D., Councillor

Third District

The Grand Forks District Medical Society has a membership of 59 this year, having gained six during the year. There was one death, Dr. J. E. Hetherington of Grand Forks.

The society held eight meetings, having an average attendance of twenty. Guest speakers included Dr. Richard Varco, University of Minnesota, and Dr. J. B. Priestley, of the Mayo Clinic.

The officers elected at the January meeting were: President, Dr. G. G. Thorgrimson, Grand Forks; vice president, Dr. R. W. Vance, Grand Forks; secretary-treasurer, Dr. L. B. Silverman, Grand Forks; delegates, Dr. R. E. Leigh and Dr. T. Q. Benson, both of Grand Forks; alternates, Dr. N. A. Hardy, Minto, and Dr. C. J. Glaspel, Grafton.

The business of the society has been capably carried out by the various officers. At a special meeting of the State Association held in Fargo, March 13 and 14, the Third District was represented by Drs. L. J. Alger and P. H. Woutat of Grand Forks.

The Traill-Steele Medical Society has a membership of nine. All physicians in the district are members, and all members are paid up in full.

Three meetings were held during the current year, the guest speakers being Dr. Charles Graham of Grand Forks, and Dr. A. H. Lawton, dean of the University Medical School.

The officers re-elected in January are: President, Dr. Thomas M. Cable, Hillsboro; vice president, Dr. H. A. LaFleur, Mayville; secretary-treasurer, Dr. Syver Vinje, Hillsboro; delegate, Dr. O. A. Knutson, Buxton.

C. J. GLASPEL, M.D., Councillor

Fourth District

The Northwest District Medical Society has now a membership of 61 members, having gained 12 new members during this year.

During the past year we have had nine meetings, which were held alternately at the St. Joseph's Hospital and Trinity Hospital. The following programs were presented at the meetings:

April 1947: Dr. William Fleeson of Minneapolis spoke on Psychiatric Problems in Children.

May 1947: Dr. C. W. Rucker of the Mayo Clinic in Rochester gave a discussion on the Eye Changes in Vascular Disorders.

June 1947: Dr. G. Seldon of the Mayo Clinic in Rochester discussed the Use of Curare in Anesthesia.

August 1947: At this meeting Dr. Wheelon prepared another of his famous sweet corn and fried chicken picnic dinners, which was well attended.

September 1947: Dr. Hemingway gave a talk on Hormones in Treatment.

October 1947: Dr. W. J. Ball on Diarrhea in Babies. Dr. O. S. Uthus on Benzedrine and Obesity. Dr. R. C. Bethea on Anti-histamine Drugs.

November 1947: Dr. Leigh and Dr. Lawton of Grand Forks spoke before our society on the new medical center in Grand Forks.

February 1948: At this meeting the following officers were elected: President, Dr. Malcolm A. McCannel; vice president, Dr. M. W. Garrison; secretary-treasurer, Dr. L. Henry Kermott.

During the year we lost one of our members by death, Dr. R. T. O'Neill.

The Northwest District Medical Society invited the State Medical Association to meet with us in Minot two years ago, but had to postpone the invitation due to a shortage of hotel accommodations. Now that we have the new hotel open and also the Country Club has been enlarged and the improvements completed, we will be in a good position to entertain the State Medical Association this year. At our March 1948 meeting we went on record instructing our delegates to extend an invitation to the State Medical Association for the 1949 session of the Association.

ARCHIE D. MCCANNEL, M.D., Councillor

Fifth District

Herewith is the Councillor's report for the Fifth District Society for the year 1947.

Our society gained one new member during the year, namely Dr. Kent F. Westley, Cooperstown, son of Dr. M. D. Westley, deceased in 1946. The membership of our society now is eleven, nine of whom practice in Valley City and two in Cooperstown.

Four meetings of our society were held in Valley City during the year. At the January meeting considerable time was devoted to legislative and public health topics and to medical economics. One scientific dinner meeting was held at which Dr. Corbus, Jr., of Fargo, addressed the group on the subject of Urology with Relation to General Practice.

Officers elected for the year 1948 are: President, Dr. J. P. Merrett; vice president, Dr. G. Christianson; secretary-treasurer, Dr. C. J. Meredith; delegate, Dr. W. H. Gilsdorf; alternate, Dr. Paul Cook.

Excellent harmony and cooperation prevail in our society.

C. J. MEREDITH, M.D., Councillor

Sixth District

During the past year three meetings were held which were well attended. The secretary reports a membership of 60 with an average meeting attendance of 34.

Dr. Herman Hemmingway discussed Endocrinology at one of the meetings and Dr. H. C. Manaugh discussed the Veteran's Medical Service program. Dr. P. Dwan presented a paper on Congenital Heart Disease and Rheumatic Fever. Mr. Harry Northum, executive secretary of the American Association of Physicians and Surgeons, discussed the program of this organization and socialized medicine.

The present officers of the Sixth District are: President, Dr. H. A. Wheeler, Mandan; vice president, Dr. T. W. Buckingham, Bismarck; secretary-treasurer, Dr. C. A. Arneson, Bismarck.

New members admitted during the year were: Dr. Clifford H. Peters, Dr. Russell O. Saxvik, Dr. G. D. Icenogle.

R. H. WALDSCHMIDT, M.D., Councillor

Seventh District

The Stutsman County Medical Society, which is the Seventh District Society, had six meetings during the year 1947, and have had three thus far in 1948.

On January 29, 1948, the following officers were elected: President, Dr. James L. DePuy; vice president, Dr. M. H. Culbert; secretary-treasurer, Dr. R. D. Nierling; delegate, Dr. W. W. Wood; alternate, Dr. John Jansonius; censor, Dr. F. O. Woodward.

At this meeting a discussion of prepayment medical care was carried on, followed by a sound film on "The Role of the Gastroscope in the Diagnosis of Gastric Disease."

At the January meeting in 1947, following the election of officers, Mr. Joseph Bovey, representing the Fredricks Stearns Company of Detroit, gave a brief talk on Amino Acids, followed by a film in technicolor on the Abdomino-Perineal Sigmoidectomy by Dr. Bacon of Philadelphia. There were sixteen members in the society during the year 1947.

Another meeting was held April 4, 1947, at which time a motion was made and carried that the society invite the State Association to meet in Jamestown in 1948. Applications of Dr. James L. DePuy and Dr. John N. Ellsworth were submitted and approved. A film on "Folic Acid" was then shown.

The next meeting was held Thursday, May 29, at the Jamestown Country Club. Dr. Arzt, who was elected president of the State Association earlier in the month, gave a brief outline of decisions reached by the House of Delegates. A three-reel film on "Postpartum Hemorrhage" by Dr. DeLee was then shown. No meetings were held during the summer months.

The first meeting in the fall was held September 4, 1947. Dean A. H. Lawton of the University Medical School talked to the society on the status of the medical school and future plans. Mr. Engebretson, Executive Secretary of the State Association, was also present at this meeting and gave a brief talk.

At the meeting on October 30, 1947, Mr. Wendeburg spoke briefly on The National Federation of Small Business. Dr. Varco, Chief of Out-Patient Department of the Veterans Hospital at Fargo, also spoke concerning the medical organization and wishes of the Bureau and staff in regard to examinations of veterans.

On November 20, 1947, a business meeting was held and discussion of choice of a medical publication was carried on. The Journal-Lancet, *Minnesota Medicine,* and *Journal of South Dakota State Medical Association* were the ones considered for the North Dakota official publication. Following this, a three-reel film on Sex Hormones was shown. Dr. John Jansonius was added to the membership during 1947 and Dr. A. L. Arends moved away from Jamestown.

Joseph Sorkness, M.D., Councillor

Eighth District

One meeting of the Southern District Medical Society was held during the year, this being at Ellendale on November 6, 1947. Dinner preceded the meeting and members of the Southern District Medical Auxiliary were guests.

The meeting consisted of a couple of movies on The Effect of the Use of Vitamins and a talk by Dr. McCarthy of Aberdeen, South Dakota, on the use of the Miller-Abbott Tube and X-ray Interpretations.

All members of the local society were present.

F. W. Fergusson, M.D., Councillor

Ninth District

The Tri-County Medical Society held three meetings during 1947; one April 16 and another December 30 at Fessenden, and a third meeting at Harvey, October 13. Dr. A. H. Lawton spoke at the Harvey meeting, setting forth his aims concerning the future of the School of Medicine at the University of North Dakota. He made it clear that his present desire is for a strong two year school instead of a four year curriculum. He stated that the greatest present need was a higher budget so that instructors might be paid a salary commensurate with their work, indicating that it is almost impossible to obtain adequate instructors because of the present low budget.

The following are the officers elected for this society for the year 1948: President, R. F. Gilliland, Carrington; vice president, D. W. Matthaei, Fessenden; secretary, W. C. Voglewede, Carrington.

F. W. Ford, M.D., Councillor
W. C. Voglewede, M.D.

Tenth District

The Southwestern District Medical Society has 22 members. We have one new member, Dr. R. J. Goulding of Bowman. Two other physicians now practicing in the Southwestern District are waiting for State Board examinations.

Two meetings of the society were held during 1947. The first meeting was held March 22nd. Routine order of business was completed followed by round table discussion regarding the Veteran Care Plan with administration through the Bismarck offices. The society concluded that the method should be very successful and that our full cooperation would be given.

The second meeting was October 25th. The meeting was preceded by dinner at the St. Charles Hotel. Guests were: Dr. Donald J. Reichart of Chicago; Mr. E. Forsyth Engebretson, Executive Secretary; and Dr. M. A. Shillington of Glendive, Montana. Following the ordinary business meeting, Mr. Engebretson reviewed various political bills involving medical practice and discussed the workings of the Veterans program as conducted through the Bismarck offices. Dr. Shillington then gave a paper on the Margin of Intractible Bronchial Asthma.

A. R. Giesdorf, M.D., Councillor

REPORTS OF STANDING COMMITTEES

The following reports of the Standing Committees were referred to the Reference Committee on Reports of Standing Committees:

Medical Education

The Committee on Medical Education met at the University of North Dakota at 10:00 A.M., Wednesday, March 31, 1948. Present were advisory members Dr. A. H. Lawton, Dean of the School of Medicine, and Dr. W. A. Liebeler, President-elect of the State Medical Association; and members of the committee Dr. W. F. Baillie, Fargo; Dr. J. A. MacDonald, Cando; Dr. C. J. Meredith, Valley City; Dr. J. H. Moore, Grand Forks; and Dr. H. E. French, Dean Emeritus, Chairman.

There was a brief presentation of the work going on, the policies, the demands for admission, the prospects for transfer of students, the standing of the school before the rating bodies, the budget, and the prospect of the new Medical Science building for which an appropriation has been made, and for which contracts have recently been made.

The group thereupon became an informal round table conference. Many questions were asked and answered, and all took part in the discussion. There was unanimous approval of the policies of the school, particularly: (a) that the prospective new building has been planned for, and is expected to house and strengthen, the work of the laboratory sciences; (b) that the first effort should be to strengthen the work in the laboratory sciences, and by so doing attempt to regain full recognition by the rating bodies; (c) that expansion, or the beginning of clinical instruction and the offering of third and fourth years' training, is not to be attempted until and when a reasonable budget is assured, for example, the passage of the mill levy in November 1948, or similar financial support; (d) that clinical instruction, when and if it is attempted, should involve largely or chiefly the dispersed plan, making use of hospital and clinical facilities in several centers in the state.

There was unanimous agreement that a well supported and successfully operating complete school would be of great value to the state. Also, that several almost identical advantages would be of much greater worth than the immediate problem of training a few more doctors. Some of these incidental advantages could be listed as follows: (a) The training of nurses and of laboratory and other technical assistants; (b) refresher and graduate courses that could be offered; (c) the assistance the school could give to the State Health Department, the Welfare Program, and the State Hospitals and Sanatoriums; (d) the tendency to cause more of our own students to locate and remain in the state; and (e) in general, the tendency to make the state a more attractive place for doctors and nurses of the right kind to think of choosing for location and practice.

It was recognized that the budget of the school has never been adequate, and that even with the budget of this biennium which is somewhat better than ever before, and the prospect of the new building, the status of the school is still critical. It was felt that the mill levy amendment soon to be voted upon should be passed, that a vigorous campaign of education should be put on to this end, and that the State Association might well make an appropriation to further such a campaign.

H. E. French, M.D., Chairman

Official Publication

Our Association is faced with the problem of choosing the medical journal which is to be the official publication. The Journal-Lancet has served in this capacity for many years. There has been agitation, on several occasions in the past, to sever connections with the Journal-Lancet but without success. However, two states, Montana and South Dakota, have done so. Montana has joined with her neighboring states in sponsoring the *Rocky Mountain Medical Journal.* South Dakota began publication of its own journal in January, 1948. This leaves the North Dakota State Medical Association as the only state association using the Journal-Lancet.

The South Dakota State Medical Association has invited our Association to join it in the co-sponsorship of a journal. We have been offered an equal voice in the determination of the editorial and publication policies of the proposed journal. Profits, if any, would be divided equally; our Association would be responsible for one-half the losses, if any. The present title would be changed to give us equal recognition.

It was understood that the Minnesota State Medical Association would be glad to make an agreement with our Association whereby its publication, *Minnesota Medicine,* would become our official journal. Upon inquiry, the Minnesota Association submitted a preliminary proposal which would give our Association a strong, although minority, voice in the control of the editorial and publication policies of *Minnesota Medicine.* The name of the journal would remain the same.

The officers and members of our Association have been given complete details of the proposals, and the arguments pro and con, in the news letter prepared by the Executive Secretary. The Council has considered the problem at two meetings during the past few months. A decision has not been reached. A questtionnaire was sent to every member in February, 1948, asking for a vote, and setting forth the following advantages and disadvantages as seen by the committee on each proposal:

JOURNAL-LANCET

Advantages:

1. Our Association is the only remaining state association represented by the JOURNAL-LANCET. (Of the three state associations formerly represented by JOURNAL-LANCET, South Dakota and Montana have dropped out.)

2. NDSMA will have much more to say about policy than in the past.

3. JOURNAL-LANCET is established both financially and professionally.

4. There is reason to believe that the JOURNAL-LANCET will allot necessary space for N.D. items and editorials.

5. No financial risk.

Disadvantages:

1. Lack of pride of ownership.

2. No participation in profits.

3. Majority on editorial board reside in Minnesota.

SOUTH DAKOTA PROPOSAL

Advantages:

1. Would be true partnership of two groups of equal strength.

2. Would bind pharmaceutical and medical professions closely together. (S. Dak. Pharmaceutical Association has joined in the sponsorship of the journal and that group in N. Dak. would no doubt be interested in doing the same.)

3. There is an opportunity to make some money for our Association.

4. All the space necessary for N.D. items and editorials.

5. Would afford an opportunity for N.D. physicians to publish their papers, some of which might be rejected by *Minnesota Medicine* and JOURNAL-LANCET.

Disadvantages:

1. Possible instability of publishing and editing staff.

2. Possibility of financial loss.

3. Difficulty in finding N.D. physicians who are interested in writing editorials, reviewing scientific papers for publication, etc.

MINNESOTA PROPOSAL

Advantages:

1. Well established and highly rated journal.

2. Opportunity to make a profit.

3. All the space necessary for North Dakota items and editorials.

Disadvantages:

1. Control of publishing and editorial policies would rest in Minnesota State Medical Association, although we have been aassured representation on the boards in proportion to our membership.

2. Possibility of financial loss.

3. Difficulty in finding N.D. physicians who are interested in writing editorials, reviewing scientific papers for publication, etc.

Fifty-eight per cent of the membership responded. The results showed 96 (47%) in favor of the JOURNAL-LANCET; 72 (35.5%) in favor of *Minnesota Medicine*; and 31 (15.5%) in favor of joining with South Dakota. Four votes were indecisive.

It should be emphasized that affiliation with either *Minnesota Medicine* or with the *South Dakota Journal* will demand more interest and activity on the part of our representatives than has been displayed in the past. The JOURNAL-LANCET will continue as before if we do not contribute more to its editorial and scientific papers. This would undoubtedly be true, also, of *Minnesota Medicine*, but it could not prevail if we were to join forces with South Dakota in the publication of a joint venture which has yet to prove its ability to survive and to remain solvent.

Your Committee is not prepared to make a recommendation at the present time. It urges the Council to reach a decision at its May meeting and to submit a recommendation to the House of Delegates for final action. Your Committee will be glad to consult with those two governing bodies during the 1948 Annual Session.

L. W. LARSON, M.D., Chairman

Necrology and Medical History

In accordance with the traditions of our profession, we pause in the affairs of life to pay our devout respect to those of our colleagues who have left our ranks, since last we met. To those bereaved we extend our sincerest sympathy. Their loss is, in a large measure, also our loss. The place of companion, friend and co-worker is never completely filled.

May sorrow of the hour be mercifully tempered with the passing of time. May each find gratification in recognition of a life spent in unselfish devotion by glorious service to mankind.

J. E. HETHERINGTON

Dr. J. E. Hetherington, practitioner of Grand Forks for more than thirty years, died May 9, 1947, at the age of 62. He was born at Larimore and was the first graduate from our University Medical School, obtaining the M.D. degree from Jefferson Medical College. He practiced at Reynolds and at Larimore before locating at Grand Forks. For a number of years Dr. Hetherington practiced with the Healy, Law and Woutat Clinic. Known as an ardent sportsman for many years, Dr. Hetherington was also a member of many professional and other groups. He was a member of the Congregational Church, Acacia Lodge No. 4, A. F. & A. M.; local, state and national medical societies and was a member of the Grand Forks Lions Club. Mrs. Hetherington died in 1946. Survivors are a brother, a sister, a daughter and a grandson.

HARRY A. BRANDES

Dr. Harry A. Brandes, long time practitioner with Quain and Ramstad Clinic, died May 12, 1947, at Bismarck. He was 59 years of age. Dr. Brandes was a native of Granite City, Illinois, and graduated from Washington University of St. Louis, in 1912. He came to North Dakota in 1914 and was in practice at Hebron and Hazen, when he left to enter service in World War I. After his discharge from service he located in Bismarck. He served our State Association as President in 1939-1940. Dr. Brandes was a Fellow of the American College of Physicians and was certified by the American Board of Internal Medicine. He was civic minded and prominent in all efforts for the betterment of his community and his state. He was a past president of the Rotary Club and the Association of Commerce. He served as an elder and steward in the First Presbyterian Church. Dr. Brandes was for three years chairman of the State War Chest and active in the Missouri Slope Area, Boy Scouts of America. His lodge affiliations included the Masonic Lodge; the Scottish Rite bodies; the El Zagel Shrine and he was a member of the advisory board for the DeMolay. Surviving are Mrs. Brandes, a son and a daughter.

FRANK E. BUNTING

Dr. Frank E. Bunting, 83, passed away at his home in Mandan, July 18, 1947, as a result of a condition of the heart from which he had suffered for several years. Dr. Bunting was a native of Michigan and was a graduate of the Detroit Medical College, obtaining his degree in 1888. He was licensed to practice in North Dakota in July 1898. After his graduation he spent several years in hospital practice in Detroit and was located at Lone Pine, California, for three years prior to coming to Mandan in 1897. He was a pioneer physician of the area west of the Missouri River. Dr. Bunting was an enthusiastic fisherman, hunter and lover of the out-of-doors. He served Morton county as health officer for over 40 years. He held life membership in the Masonic lodge of Mandan. He was a member of Couer de Lion Commandery. Dr. Bunting is survived by Mrs. Bunting and two children, a son and a daughter.

AXEL OFTEDAL

Dr. Axel Oftedal, 61, died October 1, 1947, at his home in Glendale, California. He had been a practitioner of Fargo for 25 years. He was a native of Richland county, North Dakota, graduating from high school in Minneapolis, where he later studied medicine at the University of Minnesota. He received his degree in 1914 and was licensed in North Dakota in January of 1916. Dr. Oftedal was in practice at Thief River Falls and Hendrum, Minnesota, previous to his locating in Fargo in 1919. After special training his practice was limited to the specialty, eye, ear, nose and throat. He was a past president of the State Academy of Ophthalmology and Otolaryngology. Dr. Oftedal served as a medical officer in World War I. He was a Royal Arch Mason and a member of the Alpha Kappa Kappa and ATO fraternities, a member of local, state and national medical associations. Dr. Oftedal had three brothers who were medical graduates, including Dr. Trygve, now in practice in Fargo; Dr. Arne, deceased; and Dr. Sverre, a resident of California. He is survived by Mrs. Oftedal, another brother, and three sisters.

ANDREW CARR

Dr. Andrew Carr, 93, died at his home in Minot, January 22, 1948, after an extended illness. He had practiced in Minot since 1903, diseases of the eye, ear, nose and throat being his specialty. Dr. Carr was a native of Indiana and came with his parents to Fillmore county, Minnesota, when two years of age. After 24 years his family located in Nelson county, Dakota Territory. He attended Normal School at Winona, Minnesota, and after teaching for several years attended and graduated from Rush Medical College in 1888 and was licensed May 9, 1888, in Territorial Dakota. Dr. Carr was first located at Northwood, where he was one of the founders of the Inter-County Medical Society, the first society of the Red River Valley outside of Fargo. He located at Minot in 1903 and was the first president of the Northwest District Society in 1904. Dr. Carr was a past president of the State Medical Association and also of the Academy of Ophthalmology. He was active both in medical and civic affairs of his community and state. He was one of the founders of the Northwest Clinic of Minot; organized the Minot park system and served for four years as treasurer of the Minot Normal School, now a State Teachers College. He was active in development of the local library. He helped to establish Trinity Hospital. Dr. Carr belonged to the Presbyterian Church and was holder of the 50-year membership pin of the Masonic Order. Dr. Carr held the esteem of colleagues and the public; a thoroughly dependable clinician and a splendid representative of our profession. Mrs. Carr died in 1940. Other members of the family surviving include Dr. A. M. Carr of Minot; two daughters, two brothers; three sisters, eight grandchildren and eight great-grandchildren.

SVERRE OFTEDAL

Dr. Sverre Oftedal, 64, died February 4, 1948, in Glendale, California. He was born in Alexandria, Minnesota, and was a graduate of the University of North Dakota and Rush Medical College. He was granted his degree in 1911 and was licensed to practice in North Dakota in January, 1916. For a time he held a location at Climax, Minnesota, and later relocated in Fargo, where he practiced for 20 years. He was a surgeon on the staff of the Fargo Clinic. He was a member of the Board of Education when he left Fargo in 1936. Dr. Sverre was one of four brothers who became medical men of North Dakota. Dr. Trygve is in practice in Fargo. Survivors are Mrs. Oftedal, three children and another brother.

T. C. PATTERSON

Dr. T. C. Patterson, 84, commandant of the North Dakota Soldiers Home and a resident of the Cogswell and Lisbon area for 59 years, died February 22, 1948, after a lingering illness. He was regimental surgeon of the First North Dakota Regiment of the National Guard and served with it on the Mexican Border and in World War I. He was retired from the army in December 1918, as a major. Dr. Patterson was born January 9, 1864, at Grafton, Ontario. He came to Sargent county in 1889 and practiced there until he moved to Lisbon in 1897, where he continued to practice until his retirement in October, 1946, when he assumed the command of the soldiers home. For a number of years he practiced with his brother, the late Dr. A. G. Patterson. In 1944 he was given community-wide recognition when a Dr. Patterson day was held at Lisbon. In addition to his medical work, Dr. Patterson was active in Lisbon civic affairs. He was alderman for a number of years, a member of the park commission and president of the Ransom County Board of Health. He was president of the Oakwood cemetery board and a member of the Lisbon school board. In 1944 he was awarded the 50-year button by the Masonic Lodge. He was a member of the El Zagel Shrine and the American Legion. Among his survivors are Mrs. Patterson, who is the matron at the Soldiers Home, and a sister.

RAYMOND T. O'NEILL

Dr. Raymond T. O'Neill, 46, passed away March 9, 1948, in a Minot hospital after a lingering illness. Dr. O'Neill was a native of Nebraska, a son of pioneer parents. He attended Trinity College of Sioux City, Iowa, and obtained both a pharmacy degree and his medical degree from Creighton University of Omaha. He graduated in medicine in 1928. Dr. O'Neill was in practice in Great Falls and Choteau, Montana, previous to locating in Minot in 1935. He was an ardent sportsman and in younger days a splendid athlete. He was a member of local, state and national medical societies and of Phi Rho Sigma medical fraternity. He was a member of the staff of St. Joseph's Hospital. Dr. O'Neill was a member of the Holy Name Society, past Grand Knight of the Minot Council, Knights of Columbus. He held membership in the Elks, Minot Country Club, the Cosmopolitan Club and the Downtown Quarterbacks Club. Surviving are Mrs. O'Neill, a son, two daughters, five brothers and a sister.

F. L. Wicks, M.D., G. M. Williamson, M.D.,
Co-Chairmen

Medical Economics

Your Chairman attended the following national meetings: National Physicians Committee, AMA Conference on Veterans Care, AMA Conference on Rural Medical Care, Northwest Regional Conference, National Conference on Medical Care.

In the national field, the subjects of political medicine, proper care of veterans, improvement in rural care, and trends in Medical Education have been foremost.

Political. The proponents of socialized medicine continue to actively promote their program without having achieved any further progress. However, a small group of determined individuals, headed by I. S. Falk of the Federal Security Agency, and mostly employees of the Federal government, are working unceasingly towards this goal. The new head of the Federal Security Agency, Mr. Oscar Ewing, favors all-out expansion of the agency, including federal control of Medicine.

In any discussion involving changes in the method of practice of medicine, one must consider the shift of power involved. In short, all proposed changes mean a shift of control of medical practice from the profession to lay groups or political entities.

It is our firm conviction that groups advocating such changes are primarily much more interested in the power to be derived from such control than they are in theoretical benefits to the people at large. We also believe that the majority of our profession are unalterably opposed to practicing under the domination of lay or political groups.

It is not enough for us to verbally oppose such movements, we must also actively work to see that we do not have any undesirable system of practice forced upon the people of this country. Also, we need to work for worthwhile improvements which can be accomplished.

At the present time, there are several national organizations working in this field. The AMA and particularly the Council on Medical Service is doing a good job but in the very nature of things, are unable to actively enter the political field.

We have the National Physicians' Committee which is a very active, extremely able organization, which has operated most effectively in the field and even more effectively as an agency for securing favorable publicity for the profession.

We also have the Association of American Physicians and Surgeons who are founded on the absolutely correct premise that if the doctors will stick together no one can force them to accept state medicine. This is being demonstrated by the British medical men. They voted 5 to 1 against accepting the government's program. However, it is to be hoped that we will be able to avoid even arriving at that situation. To achieve this the support of every one of us is required. Actually, each and every one of us can be of the greatest assistance by discussions with our own legislators at home.

In North Dakota, if the left wing elements are able to get control of the legislature, as they plan to do, it is quite likely that legislation affecting the practice of medicine will be introduced.

In the field of medical education, discussion is now being centered on two phases of the same problem: the future supply of physicians. There is profound difference of opinion whether we should: (1) educate more doctors, or (2) educate more doctors to be general practitioners and fewer to be specialists. Some educators believe that the present system is good, that we should give less and less doctors more and more education, and that most should be specialists. Others and many practitioners feel that too much time is devoted to premedical education, and that a doctor should be educated primarily to become a general practitioner. There is now a definite trend towards pointing the undergraduate to the field of general practice.

All of this has a very definite bearing on both the economic and political aspects of medical practice. This, I am sure, is quite evident to all of us.

During the past year your committee, in accordance with your instructions, negotiated a new fee schedule with the Workmen's Compensation Bureau. This schedule approved by the Council, is now in operation.

Your committee discussed the problem of the Welfare Board schedule thoroughly among ourselves and with the Welfare Board representatives. A few revisions were made in this schedule, actually not yet put into effect, but it was decided not to request a general upward revision at this time. The two main reasons for this decision are: (1) If, in good times, the schedule is left intact, in bad times we could also be entitled to leave it intact. (2) The State Welfare Board is temporarily short of funds because of many factors completely beyond their control.

Our relations with the State Welfare Board continue to be most satisfactory and we have the highest respect for, and confidence in their administrative officials.

In closing the report of the Committee as a whole, I would like to express the appreciation of this committee for the splendid work done by Dr. Woutat and his committee on Prepayment Medical Care, Dr. Radl and his committee on Veterans Medical Service, and Dr. Jacobson and his committee on Rural Health. The formation of these three separate committees has been a real benefit and we recommend that they be continued.

The reports of each committee follow, and each report has the approval of the Committee on Economics as a whole.

Finally, a short word of appreciation for the excellent cooperation and untiring work of our executive secretary, Mr. Forsyth Engebretson.

W. A. WRIGHT, M.D., Chairman

VETERANS MEDICAL SERVICE

Activities of the North Dakota Veterans Medical Service Division, since a report submitted to the House of Delegates in 1947, may be best characterized by stating that they have been in a state of flux. Cooperation with the Veterans Administration at Fargo, North Dakota, has continued to be good and there have been a number of conferences with them in an endeavor to solve our mutual problems. One of the greatest problems has been the comparatively high percentage of cancellations of authorizations issued, the percentage running as high as 22 per cent. This has been one of the basic problems throughout the life of this organization. Some of the reasons are due to lack of cooperation on the part of the veteran concerned, but there are other justifiable reasons, such as changes of address resulting in delay in forwarding authorizations; others are action on the part of a veteran whereby he consults various service officers in an endeavor to find out the reason why he is called for examination and, in some instances, probably deliberate delay so that he will receive the pension as long as possible, thinking that it might be reduced if and when he does report for examination.

The variability of the load of work, that is, of the total number of examinations, has also resulted in the Bismarck office not being able to plan accurately on the number of examinations to be made. Up until August, 1947, the number of examinations authorized was actually insufficient, and especially because of cancellations there was insufficient net income to the office to put it on a sustaining basis. As a result of a conference in Fargo with the Veterans Administration, the number of authorizations was increased considerably and for a number of months the Bismarck office was actually in the black by about $100 or $200 a month. Since about November, 1947, however, the work all in all in the office is running somewhat behind in paying its monthly expenses. Conferences have been held recently with the Veterans Administration but the Fargo office is unable to tell us with any degree of certainty of the work load we can expect in the near future, and especially cannot tell us anything about the distant future.

The North Dakota State Medical Association advanced $5000 for this program and at the present time part of this could be repaid to the Association. However, we cannot continue to do business as a money-losing organization indefinitely. In order to have some information as to what changes might be made or how the business of the Veterans Medical Service Division might be liquidated in the event we continue to lose money, we have corresponded with the Veterans Administration as to possible changes. From the beginning, North Dakota has followed the so-called Michigan plan. One possible change would be to change to the so-called Kansas plan whereby a list of designated examiners would be sent to the Veterans Administration and the Veterans Administration at Fargo would handle the administrative work now being done by the Bismarck office of this association. Another possibility would be for the Veterans Medical Service Division to continue to function as at present but that the Veterans Administration would underwrite, that is, would guarantee the actual expenses of the Bismarck office. Whether they would wish to put in some of their own employees and otherwise exercise much more control than they do at present is not known. Another possibility, but probably a distant possibility, is for the Veterans Administration to pay us in full for the deficits incurred so far. It is hoped that we will have some official word from the Veterans Administration before the annual meeting of the House of Delegates. We have been led to believe that the Veterans Administration would make every attempt to see that the State Association does not lose financially in this entire matter.

An important point to take into consideration is that if one were to change to the Kansas plan, a period of time, anywhere from two to three months, would be required simply to liquidate business, that is, to clear all the records, pay the participating physicians and in general terminate the business after a certain cut-off date. During that period of time there would be expenses incurred but no income. It is our belief that the Veterans Administration might help us in that problem.

It is to be remembered that the Veterans Administration has had insufficient medical personnel and apparently will have even less medical personnel in the future and they wish and need our help on out-patient examinations and on out-patient treatment. Furthermore, we should not forget, from the viewpoint of organized medicine, that our continued assistance in the medical examination and medical care of veterans reflects to our credit.

The Veterans Administration still objects somewhat, but to a much lesser degree, on the type of reports submitted. They believe that some of them are still incomplete, but in general the character of examinations and character of reports has improved. Mr. Samuel Gurke replaced Mr. R. H. Penwarden as director of the program and has been very efficient. I believe the office is run in an efficient and economical manner.

Doctors in general throughout the state continue to support the program and to date there have been only three resignations from the program. It has been found that some of the participating physicians did not have office equipment for certain examinations requested by the Veterans Administration and for that reason examinations had to sometimes be referred to a physician other than the one requested by the veteran. This has led to some misunderstanding but the explanation as given seems only reasonable. At the conference of County Medical Society Officers and the Council, and the Meeting of the Committee on Medical Economics, held at Fargo on March 13th and 14th, the entire problem was discussed and representatives of the Veterans Administration were present. We emphasized to them our problems, our willingness to help in the examination and treatment of veterans, but that it is only fair to them and to us that a consistent policy be formulated so that the State Association could make definite plans and adhere to them so far as possible.

It is further anticipated that a supplementary report will be made to the House of Delegates, reporting further progress in our negotiations with the Veterans Administration. The aim of the Committee is to work out an administrative arrangement whereby our Association will not be liable to either gain or lose money.

It is recommended by your Sub-Committee that specific authorization be given by the House of Delegates to the Council to make any necessary changes as to the basic operation of this program, upon recommendation of the Committee on Medical Economics.

R. B. RADL, M.D., Chairman

PREPAYMENT MEDICAL CARE

Inasmuch as the question of the adoption of a statewide prepayment medical care program involves one of the most important decisions ever to be made by North Dakota physicians and, inasmuch as it is felt that all delegates should be advised without emotional persuasion but as accurately as possible as to attitude of the committee charged with this work, the minutes of the last meeting of this committee are included in this report and follow:

"Minutes of the Meeting of the Sub-Committee
on Prepayment Medical Care—Feb. 14, 1948

"The meeting of the Sub-Committee on Prepayment Medical Care of the Committee on Medical Economics was called to order at 5:30 P.M., in the home of Dr. W. E. G. Lancaster, Saturday, February 14, 1948, in Fargo, N. D. In attendance were Chairman P. H. Woutat, Grand Forks; J. C. Fawcett, Devils Lake; J. L. Devine, Jr., Minot; and W. E. G. Lancaster, Fargo. Also in attendance were Drs. P. G. Arzt, Jamestown; O. A. Sedlak, Fargo; M. S. Jacobson, Elgin; and R. B. Radl, Bismarck. E. F. Engebretson took the notes of the meeting.

"Chairman Woutat read an excellent resume of the history of prepayment activities in North Dakota and a resume of prepayment plans throughout the nation. He pointed out that there were two broad categories of plans which might be discussed, those being: (1) Commercial, and (2) Physician-controlled voluntary non-profit plans. Of the latter category he pointed out that there were three types: (1) indemnity plan, (2) service plan, and (3) a combination of the two forms. He pointed out that the third type involves an income limitation which varies considerably among the various plans.

"He reviewed the history of the AMA in its sponsorship of the voluntary non-profit plan and the final development of the Associated Medical Care Plans, which is an organization established at the instance of the AMA to act as a clearing house and to foster plans throughout the nation. He announced that General Paul R. Hawley, who recently resigned as Chief Medical Officer of the Veterans Administration has taken over the directorship of a joint committee representing Blue Cross and AMCP. He mentioned that the Blue Cross has in certain parts of the country added medical and surgical endorsements to their hospitalization policy and warned that this is not a development to be encouraged in that it increases the tendency of hospitals to enter the practice of medicine.

"In connection with his report on commercial plans, he indicated that he had had conferences with several commercial companies and associations such as the Health and Accident Underwriters Conference and the Conference of Health Insurance. Chairman Woutat provided parallel charts showing the comparative coverage benefits and premiums of sample commercial and non-profit plans, indicating in general that the policy holder receives pretty much what he pays for. The charts indicated that the premium would have to be comparatively high, were medical coverage included. Chairman Woutat spoke very highly of the John Marshall Insurance Company, a comparatively new commercial concern headed by a gentleman who had been a high executive officer in the Blue Cross. The company's business is confined to writing medical, surgical and hospital coverage. The head of the new company states that he left Blue Cross because of certain inherent weaknesses in non-profit organizations which only commercial companies can correct. His company is now in the process of concentrating its development in Arkansas and would not be in a position to enter North Dakota for at least two years.

"Chairman Woutat reported that the St. Paul Mercury and Indemnity Company was not overly satisfied with their situation in South Dakota. Officials of that company stated that many of their South Dakota agents were local real estate agents and did not care about selling medical, surgical and hospital coverage. Dr. Woutat called attention to the expansion of the Farmers Union in this field, indicating that at the present time the Farmers Union was confining their activities to indemnity policies, to which it was assumed the North Dakota physicians would have no objection. He indicated that objection would arise when the Farmers Union steps out of the indemnity type of policy and attempted to write a service plan over which they would have entire control and doctors would be denied control in the establishment of medical policy.

"He reported favorably on the development of the Cass County Plan, showing that the plan now has reserves in the neighborhood of $20,000 and coverage of 8,000 individuals in the Cass county area. He reported that the Fargo doctors were well satisfied with the plan and that the only objection which has been raised, and then only in isolated cases, involved the $150 limitation of fees. He pointed out to the Sub-Committee that they could recommend: (1) Expansion of the Cass County Plan; (2) Expansion of the Cass County Plan modified; (3) A plan to attract the expansion of commercial insurance coverage; (4) Make no recommendations at the present time.

"Dr. Woutat then listed a number of factors which should be taken into consideration in making a decision, which include: (1) That the majority of the doctors should be willing to cooperate in the plan before the same is undertaken; (2) That the AMA and physicians throughout the rest of the country believe that the statewide development of a prepayment plan is the first offense against the federalization of medicine; (3) That the Taft, Ball, Smith grants-in-aid for the care of the indigents would probably fit into a non-profit plan, but not into a commercial plan.

"After the conclusion of this resume, the meeting was open for discussion.

"Only four secretaries of local societies had responded to a request that the Sub-Committee be informed as to the opinion of the members of the respective societies. The Sheyenne Valley Society indicated that they would prefer to do nothing at the present time. The Stutsman District Society indicated that they would prefer to do nothing at the present time. The Devils Lake Society indicated that they believed a plan similar to the Cass County Plan should be expanded statewide at the earliest possible time. The Sixth District indicated in a somewhat confusing resolution, that the Cass County Plan ought to be expanded. Dr. Woutat reported that the Grand Forks District is against doing anything at the present time. He further reported that the physicians have a very poor understanding of the problem. It was also reported that the Devils Lake District doctors do not have a very good grasp of the problems involved. Dr. Devine of the Northwest District reported that their membership would like to put it off, but the majority would back it if the same was established. After some discussion as to the attitude of the profession throughout the state, the concensus of opinion seemed to be that while there exists a general desire to put off the development of such a plan, the doctors nevertheless are not nearly as opposed to the adoption of a program as they have been in the past. It was thought that the present attitude is more an attitude of regret in the change in the economic aspects of the practice of medicine which has up to recent times been satisfactory. It was pointed out that generally speaking, two major objections exist in the minds of the physicians to the Cass County Plan: (1) $150 maximum fee limitation; (2) Lack of income limitation.

"The lack of income limitation was discussed first. It was pointed out that doctors had not become accustomed to the idea that a person earning a high income should be charged but $150 for a piece of major surgery. It was indicated that the doctors might accept the program more readily if the Cass County Plan were modified so that income limitations were written into the policies. This would of course result in a partial service, partial indemnity contract. It was pointed out by Drs. Lancaster and Sedlak that the inclusion of income limitations would make it much harder to sell and much less desirable to the public in general. It was agreed that the expanding of the Cass County Plan and thereby the development of a service program would offer something of real value to the rural people. The determining of rural income so as to apply the income limitation presents a problem of obvious difficulty. It was the opinion of the Fargo doctors that in the long run the big percentage of the public holding these policies would be the type which would otherwise be slow pay and that the income limitation therefore was not of the importance as believed to be.

"A great deal of discussion was had in connection with the $150 maximum fee, which is included in the Cass County Plan. This of course means that a doctor may not charge more than $150 for any procedure regardless of the complication. Again it was thought by the Fargo doctors that the majority of the people holding such policies would over the years be slow pay and that the $150 limitation resulted in the doctor getting as much or more for his services as he had in the past.

"Discussion was carried on as to the possibility of raising the maximum fee to $200 or $225. It was pointed out that this would obviously necessitate the refiguring of the premiums on an actuarial basis. It was the concensus of opinion that the premium should not be substantially increased, as it would increase the resistance in the sales of the policies. It was decided however that the schedule ought to be reviewed and suggested that when a resolution, if any, were adopted as a result of the meeting, that such a review be directed.

"It was explained by Drs. Lancaster and Sedlak that the objection made by the House of Delegates to the Cass County Plan last May had been largely overcome in that they were now allowing minor surgery and fracture work to be done outside the hospital. At the present time however they are still limiting the performance of the opening of abscesses to the hospital. It was felt, however, that the doctors in Cass county are not taking improper advantage of the program and they would soon amend the regulations so that even this work could be done outside of the hospital.

"Drs. Devine and Fawcett called attention to the impractical philosophy of those who would sit back and not develop the program any farther on the assumption that a plan existed in North Dakota which could be expanded were it necessary to forestall federalization in the future. It was their opinion, and the concensus of opinion of all present, that such an attitude would result in the expansion after it was too late to be of any use. It was pointed out that now is the time to expand, while the state is well off, so that rural people could be got into the habit of insuring themselves against catastrophic medical costs.

"The question of expanding the Cass County program to include medical coverage, was discussed at length and it was felt that this, from the standpoint of sound business practices ought not to be undertaken from the beginning. It was felt that a policy offered which would cover the catastrophic cost of illness on a service basis would be in the best interest of the public and the profession at least until enough experience has been gained so that it might be determined whether or not the public would be willing to pay the higher cost for the more complete coverage.

"Dr. Jacobson, who practices in a community where a high percentage of the citizens are members of the Farmers Union, brought up a question as to whether or not members of the Association would be permitted, if the plan were expanded, to also cooperate with the Farmers Union indemnity insurance. It was pointed out to Dr. Jacobson that such dual cooperation would be entirely satisfactory so long as the Union or any other group or business selling such coverage, stayed on an indemnity basis and did not attempt to set up a plan under which they offered to render medical services. It should be pointed out that any health insurance coverage should be encouraged, regardless of the source of such insurance, so long as it does not take the form of a plan whereby the policy of medical care would be directed by lay people rather than physicians.

"Commercial insurance was discussed at length and it is apparent that from the standpoint of the physician it has some definite advantages. The adoption of such a plan would largely remove the burden of responsibility from the doctors, both in the initiation of the program and the possibility of sustaining loss. It was felt, however, that the people of North Dakota would be offered but little advantage under a commercial plan and that the adoption of such a plan resulted in little more than the granting of an endorsement to the company or companies so that they might use that endorsement in the advertising of the sale of their policies. It was felt that only through the offering of a non-profit service plan that real advantage could be provided our rural people.

"Considerable discussion was given over to the problem of expanding a plan similar to the Cass County Plan were the House of Delegates to approve the same. It was pointed out that the accomplishment of the expanded plan could not be done in a short time. It was further pointed out that the difficulty either in expansion of a commercial or non-profit plan in North Dakota lay in the enrollment of the rural population. A shortcoming of the commercial plan in North Dakota is that their agents in rural communities are normally bank cashiers or real estate men who could not be counted upon to campaign for substantial enrollment. The difficulty of enrollment under the expanded plan similar to the Cass County Plan and operated by the Blue Cross is somewhat similar. The field personnel of the Blue Cross is limited and while they would campaign extensively in each community into which they went, their efforts would necessarily be piecemeal. It was pointed out that the AMA, through their Brochure No. 3, prepared by the Council on Medical Service, has recommended and set forth a system of the development of local health councils for the express purpose of enrolling people in rural communities in the prepayment programs. This idea of the use of local health councils for this purpose was originally developed in Iowa where they are having considerable success with it. A widespread enrollment of rural population would probably necessitate the use of such an idea.

"It was suggested that if the House of Delegates did pass the recommendation of the expansion of a plan similar to the Cass County Plan, that the responsibility for all of the details in laying the ground work for the plan and the responsibility for deciding when sufficient ground work had been laid so that the plan might be put into active operation be delegated to the Board of Directors of the statewide North Dakota Physicians Service, Inc.

"Drs. Sedlak and Lancaster gave assurance that the Cass County group were prepared to transfer their business to the statewide plan, thereby giving up their present board of directors and take their just proportion of representation on the board of directors of the expanded statewide plan."

The following is the specific report of the Sub-Committee on Prepayment Medical Care as a result of the meeting reported above. While the recommendation calls for the development of a voluntary prepayment medical care plan on a service basis by the doctors of North Dakota as being in the best interest of all people in North Dakota, special attention is directed to the fact that it is the belief of the committee that any health insurance coverage should be encouraged regardless of the source of such insurance so long as non-medical groups do not undertake to sell or undertake to guarantee the rendition of medical services. It is the opinion of this committee that the rendition of medical services can be properly performed or guaranteed only by a properly licensed practitioner of medicine.

"To the Committee on Medical Economics:

"Your sub-committee on Prepayment Medical Care met in Fargo, North Dakota, on February 14, 1948.

"The committee has given study to various types of prepaid medical care insurance both commercial and non-profit throughout the country and considered the situation in our own state.

"The following pertinent facts were brought out:

1. The House of Delegates of the AMA at its January 1948 meeting urged the expansion of medically controlled non-profit plans as rapidly as possible.

2. There is increasing commercial insurance company activity in this field and some very attractive policies are being offered. Investigation indicates that commercial insurance company expansion in this sparsely settled state will be slow, most of their efforts being directed to large population centers.

3. There have been a great many commercial hospital and surgical obstetrical coverage policies sold in this state. How many, no one knows.

4. Medically operated non-profit plans are also increasing in number throughout the country and are apparently successful.

5. The opinion of the physicians of this state is still well divided as to the advisability of starting our own plan on a statewide basis. There is more, but still not adequate knowledge of the subject on the part of the physicians in the state, but the sentiment against such a plan is much less than it was previously. This statement is based on letters received by the chairman of this committee from some of the local societies, and by personal communication from the committee members as to the sentiment of their respective areas. The most prevalent attitude seems to be that it should be postponed as long as possible.

6. The Cass County Plan is growing and indications are that it is successful. Only recently have their policies been offered to rural people, and it is too early to judge their response.

7. Physicians who have had experience with the plan in Fargo felt that the participation of a high percentage of the

physicians in the state should be sought before such a plan would be a success.

8. If the House of Delegates were to instruct the expansion of the Cass County Plan on a statewide basis it is estimated that it would take at least a year to fully inform the physicians of the state and to enroll enough participating physicians to assure its success.

9. It was considered that a service type plan similar to that in Cass County will best meet the needs of the state.

10. If it should be decided that statewide expansion of a plan similar to the Cass County Plan can be undertaken, it was suggested that it might be best to set up a Board to fully inform the physicians of the state on all phases of the subject, and enroll physicians to participate. Such a Board should probably have power to decide when the plan should be started on a statewide basis."

"After the above and numerous other considerations, most of which can be found in the minutes of the committee meeting, the following was adopted:

"The subcommittee on Prepayment Medical Care, after thorough discussion, favors a non-profit physician controlled service type plan. After studying numerous plans throughout the nation, the committee recommends that a plan similar to the Cass County Plan be adopted on a statewide basis rather than on a local society option basis. This committee further recommends that in case the above recommendation be adopted there be investigation made toward a satisfactory readjustment of the fee schedule."

Philip H. Woutat, M.D., Chairman

RURAL HEALTH

Your Committee on Rural Health is a new sub-committee, responsible to the Committee on Medical Economics and provided for by the 1947 House of Delegates.

Your Committee has held one meeting during the past year, in Fargo, in conjunction with the Local Society Medical Officers Conference. During the past year your Chairman has attended the National Rural Health Conference of the AMA held in Chicago. As a member of the North Dakota Health Council, he has participated directly in numerous problems concerning rural health in North Dakota.

This past year considerable work has been done in developing better rural medicine in North Dakota. To attract younger physicians to the rural areas in this state has been and will very likely continue to be a problem. The developing of a few small rural hospitals, properly placed, will attract these younger physicians, particularly if a small group is developed—three or four physicians working together, or several physicians working independently in the immediate territory, all using the same open staff hospital. These rural hospitals, particularly in western North Dakota, should be located in localities 50 to 80 miles away from the larger hospitals, and not too close to one another, so that each rural hospital will have a large enough trade territory to insure adequate financial support.

The prevailing shortage of nurses has been especially acute in the rural areas of the state. In an effort to overcome this, it has been necessary to offer nurses going to rural areas higher salaries, to provide satisfactory living accommodations, and often forms of recreation. The nurses' aid is used extensively in the rural areas. The North Dakota Medical Association, during the last legislative session supported the North Dakota Nurses in the establishment of a practical nurses training course, which it is hoped will help meet the shortage of bedside nurses.

The Hill Burton Program is being activated in the state through the agency of the State Health Department, and sixteen proposed rural hospitals have been given a priority rating. There are three rural hospitals under construction that have such a rating. They are located at Hazen, Hettinger and Elgin. The State Health Planning Committee, which has been designated by Governor Aandahl as the official agency for the allocation of federal monies, has approved the allocation of money to the following hospitals in North Dakota for first year construction: Bowman, Cooperstown, Hettinger and Watford City. Many more rural communities are planning to build hospitals. Most of them will need federal funds.

The Chairman of this Committee strongly favors the expansion of a prepaid medical care plan on a service basis, as a substantial factor in the providing of better distribution of medical care in rural areas.

Many North Dakota groups, such as the Parent Teachers Association, the farm groups, labor and the public in general, are showing an increasing interest in questions relating to the health of people in North Dakota.

In particular, your Committee would like to have the House of Delegates give consideration to the authorization of this Committee's sponsorship of Health Councils. During the past year the AMA through the Council on Medical Service has prepared a plan entitled Medical Care Prepayment Plan Development through a Local Health Council. For the sake of brevity only the most general outline of this plan is included in this report for consideration. Your Chairman, on invitation, will be happy to attempt any more detailed explanation as may be desired. The following is a quotation from the aforementioned bulletin:

"*Development of a Local Health Council.* Local health councils are generally similar in their basic concept; however, wide variations are found in the completeness with which they reach the entire community. A single program cannot be devised that will meet the requirements of every area. These requirements depend on the extent of community consciousness, and on its readiness to accept responsibility. Success of the program depends to a large extent on local leadership. A group of influential persons must support the plan enthusiastically. These persons must be well informed in order to spear-head the movement and enlist the support of all groups in the community. Representatives from these groups are the nucleus for a local health council.

"*Medical Society Initiative.* Support of the medical profession of any community health program is essential to success. It adds prestige and lends confidence to the program. If a health council has not been formed and is thought desirable, the local medical society should, at least six weeks prior to any organized community health improvement effort, call together community leaders and local organization representatives to form a county or local health council.

"*Council Representation.* Representation on the council is important. In general, a local health council should include representatives from five groups: (1) the medical profession; (2) allied and auxiliary professional groups who render or assist in rendering health services; (3) citizens groups indicating a continuing interest in health and medical care; (4) voluntary agencies organized for the purpose of developing and expanding special phases of health and medical services; (5) governmental agencies concerned with health and medical care.

"*Objectives of Local Health Councils.* (1) Bring together medical, allied professional and citizen groups for discussion, debate, and interchange of opinions and planning; (2) Encourage, stimulate, foster and support the establishment of health and medical care programs in the local area. These programs may be concerned with health education and may emphasize the prevention of disease. They may include the distribution of medical and allied professional personnel, the adequacy of hospital and medical facilities, and the methods of meeting the costs in voluntary prepayment plans. (3) Devise means for reaching all of the people with the necessary emphasis for extending the programs into rural areas (theoretically, towns of less than 2,500 people and people living outside of cities and towns). (4) Serve as a clearing house on health and medical care problems and programs; facilitate joint planning where such is needed to speed up approved programs and to reduce duplication of efforts."

It would seem the development of some such plan, particularly in the event that this House of Delegates does vote to extend a service prepayment plan in North Dakota, will be of utmost importance. This conclusion is based on the fact that it is difficult to see how widespread enrollment, particularly within the rural communities, may be accomplished without this type of an organization. In general the increased improvement of rural medical care must be a cooperative undertaking by all genuinely interested people within the rural area. The medical profession cannot accomplish it alone, governmental agencies cannot accomplish it alone nor can farm groups, labor groups, or other non-professional groups accomplish the task alone.

M. S. Jacobson, M.D., Chairman

Maternal and Child Welfare

The Committee on Maternal and Child Welfare of the North Dakota State Medical Association met in Fargo, North Dakota, on April 11, 1948. The following resolutions were discussed and passed upon favorably:

1. The present Rh factor typing, as done by the Laboratory Division of the State Health Department, be continued and also enlarged to include pre-marital examinations. The laboratory division of the State Department of Health develop an Rh factor titration service. Service charges for laboratory work are to be paid by the doctor or patient.

2. A short form, to be used in reporting premature births, be adopted and the long form of the Children's Bureau be discontinued.

3. Dr. Dyson represent the MCH committee and draw up a letter on congenital malformations in relationship to virus infections to send out through the offices of Mr. E. Forsyth Engebretson.

4. The New York State Sanitary Code be incorporated in the State Plan for Hospital Construction.

5. Senate Bill 1290, National School Health Act of 1947. be opposed on the grounds that it is unnecessary, unwarranted, and impractical.

Senate Bill 1290 proposes the granting of money by the federal government to the various states to enable them to establish and develop school health services for the prevention, diagnosis and treatment of physical and mental defects and conditions of school children, all of these services to be provided to all school children without regard of the ability or the parents to pay for such services.

J. H. Moore, M.D., Chairman
L. G. Pray, M.D., Acting Chairman

Pneumonia

The Committee on Pneumonia held no formal meetings during the current year. It is the opinion of your Chairman that efforts of the Committee in prior years have fairly well accomplished the job of establishing types of treatment and developing keen interest among the profession in this disease. While there did not seem to be an urgent necessity for a meeting of the Committee, it is thought that the following state totals for the incidence of pneumonia, the place of treatment and kind of treatment will be of interest to the profession.

Pneumonia Cases by Month

Month	Cases
January	138
February	84
March	129
April	104
May	48
June	47
July	38
August	28
September	40
October	61
November	53
December	52
Total	822

Pneumonia Cases by Age and Sex

Age Group	Male	Female
Under 1 month	10	15
Over 1 month and under 1 year	52	30
1 to 4	64	53
5 to 9	39	29
10 to 14	18	13
15 to 19	22	9
20 to 29	35	16
30 to 39	32	20
40 to 49	30	10
50 to 59	31	20
60 to 69	45	36
70 and over	84	68
Not stated	24	17
Total	486	336

Type of Treatment

Sulfa	99
Penicillin	401
Combination of Sulfa and Penicillin	53
Other	13
No information	256

Pneumonia Deaths: Total 1946—167; Provisional 1947—184

Kind of Pneumonia

Lobar	267
Broncho	438
Other (not spec.)	77
Not stated	40
Total	822

Place of Treatment

Home	42
Hospital	531
Not stated	249
Total	822

The Committee on Pneumonia recommends that in view of the nominal increase of pneumonia deaths from 1946 to 1947, more effort be made for earlier diagnosis of pneumonia and prompt therapy be initiated.

O. W. Johnson, M.D., Chairman

Cancer

Your Committee on Cancer has had one meeting during the past year. It met with the two other members of the Executive Committee of the North Dakota Cancer Society. Action taken included authorization for the incorporation of the Society and approval of a budget for the fiscal year. Incorporation procedures have been completed and the new Board of Directors will be selected, and a meeting held, in the very near future. The Board will consist of 15 members of which eight will be physicians. Your Committee requests that authorization be given to increase the size of the Committee from four to eight to comply with the provisions of the newly incorporated North Dakota Cancer Society.

The North Dakota Cancer Society has continued its program of lay and professional education during the past year. It has also granted a limited number of loans to worthy patients to help defray the hospital and doctor bills. In every instance there has been a reasonable assurance that it was a curable case. Obviously the Society does not have sufficient funds to meet the demand if it were to defray the expenses of every cancer patient who would ask for help if given an opportunity to do so. Service to cancer patients has a strong appeal, especially in the collection of campaign funds, but it is doubtful that the Society could ever collect sufficient funds for such a program.

Forty-one North Dakota physicians attended the Refresher Course in Cancer for general practitioners sponsored by the Minnesota and North Dakota Societies at the University of Minnesota in January, 1948. The course was well received and will undoubtedly result in earlier diagnosis and treatment of cancer in North Dakota. A course will be given again next winter and it is the hope of the Society that those who have not attended one of the previous courses will make every effort to attend in the future.

The members of our Association are urged to cooperate with the North Dakota Cancer Society in every way possible. The Society depends on the medical profession for support and guidance. We cannot ignore those splendid lay men and women in our state who wish to assist us in the fight against cancer which still remains the second cause of death throughout the nation.

L. W. Larson, M.D., Chairman

Tuberculosis

We feel that the physicians and interested lay people of North Dakota may be justly proud of the progress being made in the campaign against tuberculosis in this state. We are happy to report that provisional figures for the number of reported deaths from tuberculosis in North Dakota during the year 1947 as compiled in March of the present year was only 82, a figure which gives us a mortality rate per 100,000 population of 14.8. It is to be noted that this is the lowest figure we have ever attained for mortality from tuberculosis in North Dakota. Although we do not as yet have provisional figures from other states in the country, so that we can determine our standing in comparison with the rest of the United States, we may be assured that our figure of 14.8 for 1947 will stand us well up at the head of the list. Deaths from tuberculosis in 1947 have not as yet been broken down as to race, but we may be sure that some 15 or 20 of the 82 deaths were among the 10,000 or so Indians in the state. When these Indian deaths are subtracted from the total of 82, we can readily see that we are establishing an enviable low rate for tuberculosis mortality among the whites. The over-all figure for the United States is about 40.

Even among our Indian population, we are proud of the great advance which has been made during the past several years under a program of cooperation with the Indian Service of the federal government. In 1939, mortality rate for Indians in North Dakota was 370 per 100,000, an appalling rate. It was 258.8 in 1941. We are happy to report that in 1946, only 17 Indian deaths were reported in North Dakota from tuberculosis, for a mortality figure of approximately 170 per 100,000. Although this remains high, it is certainly a tremendous improvement over the 370 reported for 1939.

An important part of the anti-tubercuolsis program is efficient reporting of tuberculosis cases to the State Health Department by physicians who diagnose the cases. In 1947, 295 new cases were reported in North Dakota, giving us a ratio of reported cases to deaths of 3.6 to 1. Although this falls somewhat below our record figure of 4.3 in 1941, when North Dakota led the entire United States for efficient reporting of cases, our figure of 3.6 is still excellent. We shall be interested to see how this figure compares with other states for the year 1947. In view of the intensive program being waged against tuberculosis, it is to be hoped that physicians of the state will continue to report cases efficiently and promptly.

Several factors have been at work to make it possible for us to make this progress against our leading communicable disease. Some of these will be discussed briefly.

Our miniature film survey, which has been extensively discussed during the past few years and which began efficient operation in 1946, has improved rapidly in effectiveness. At the present time, two mobile units and one portable unit are operating. During 1947, 92,600 miniature films were taken. Although there has been some criticism concerning the percentage of population X-rayed in various locations, this figure of 92,600 representing about one-sixth of our total population, would seem to me to be a pretty good year's work, when one considers our predominantly rural type of community. Thus far in 1948, about 17,220 films have been taken. The effectiveness of the program may be seen from the fact that 1,966 suspicious and 117 definitely positive tuberculous cases were reported during 1947, as a result of the miniature film survey. Although there have been multiple difficulties and criticisms concerning the initiation and operation of this program, its effectiveness is improving rapidly, and it is to be hoped that further strides will be made.

As may be seen from the figures above, much of our success in the campaign against tuberculosis has been due to the very marked reduction in the number of deaths from this disease among the small number of Indians in the state. For many years, the Indian Service has been aware of the very high mortality rate from tuberculosis, and various surveys have been conducted on the reservations. However, adequate treatment was not available until recent years. In 1940, Dr. Northrop, then superintendent of the North Dakota State Tuberculosis Sanatorium, completed an arrangement with the Indian Service whereby six beds at the sanatorium were reserved for Indians at all times. This program was so successful that the Indian Service made a contract with the Board of Administration for treatment of up to forty Indians at all times in the North Dakota State Tuberculosis Sanatorium, beginning July 1, 1942. Since that time, an average of 35 Indians has been under treatment at all times. During the past year, this average has dropped to 31, due to the lowered number of Indian cases. A smaller number of Indians from reservations in the state are treated at the Indian sanatorium at Rapid City, South Dakota. We wish to commend the Indian Service on their whole-hearted cooperation in this program and sincerely hope that the federal appropriation for this project will be continued indefinitely. The contract is renewed at annual intervals. In the meantime, various reservations have conducted extensive X-ray examinations of Indian people, and a miniature film unit of the State Health Department conducted a survey during 1947 of the Turtle Mountain Indian Reservation at Belcourt and the Standing Rock Indian Reservation. Due to foresight on the part of the people of North Dakota, our state sanatorium is sufficiently large so that treatment of these Indian patients has not interfered with treatment of the white citizens, and we have had no waiting list for new patients at any time.

The North Dakota Tuberculosis Association has for many years been of great assistance in education among the people concerning the disease, tuberculosis. As a result of income from the sale of Christmas Seals, this association has paid for chest X-rays of indigent tuberculous suspects and rechecks of indigent patients. We feel their work has been excellent.

During the past few years, our State Health Department has made rapid strides in the follow-up cases, including suspects, known cases not isolated at the Sanatorium, and sanatorium ex-patients. We feel that this follow-up of cases is an extremely important part of our program, and it is to be hoped that further success will be attained as the efficiency of the follow-up program improves.

Great credit is due to the physicians of North Dakota who, in spite of frequently limited facilities, have done excellent work in diagnosis and follow-up of tuberculous cases, regulation of convalescence of patients discharged from the sanatorium, and continuation of treatments, such as pneumothorax and pneumoperitoneum.

Recent improvements in methods for the treatment of known cases of tuberculosis have been of some assistance in reducing the mortality from the disease. The use of streptomycin in selected cases undoubtedly saved a few lives during 1947, and as this drug is becoming less expensive and its use better understood, we see more and more beneficial results from its use. Other less spectacular improvements in treatment have also been of assistance. However, it must be remembered that spectacular cures of far advanced cases do not by any means take the place of early diagnosis, efficient reporting, and proper isolation and follow-up of cases. We must remember that the far advanced case with positive sputum who obtains a remarkable cure at the sanatorium may still have exposed many people before his case was detected, some of whom will later develop clinical tuberculosis. If this case could have been detected in an early stage or isolated before the sputum was positive, several lives might have been saved, instead of one.

During the year since the last annual meeting of the State Medical Association, the Tuberculosis Committee has met on two occasions. On August 25, 1947, members of the committee met with Dr. R. O. Saxvik, State Health Officer, Miss Helen Katen, Executive Secretary of the North Dakota State Tuberculosis Association, Dr. H. M. Berg, representing the State Roentgenological Society, Dr. O. P. Erickson, then a member of the U. S. Public Health Service assisting in the administration of the miniature film survey in North Dakota, and guests. This meeting was called by Dr. Saxvik for the purpose of discussing the miniature film survey and methods for interpreting and reporting the miniature films. We believe the main benefit which came out of this meeting was the demonstration of the rapid strides in efficiency the miniature film survey had made, and also the excellent progress the State Health Department had made in follow-up of tuberculous cases.

A meeting of the Committee on Tuberculosis was called for Saturday, April 10, 1948, in Fargo. However, due to impassable roads, I was unable to attend, and I understand the attendance was small. The meeting was therefore held in conjunction with other committees interested in public health projects.

It is to be hoped that the encouraging progress in the campaign against tuberculosis in North Dakota will continue unabated. The Committee on Tuberculosis and physicians of the state of North Dakota should continue to co-operate in every possible way with the State Health Department, the Indian Service of the federal government, and the North Dakota Tuberculosis Association.

W. L. Wallbank, M.D., Chairman

Fractures

There have been no meetings of the Committee on Fractures during the past year. There has been no change in our policy that we have been carrying out for the past several years. Communications from the Chairman of the National Fracture Committee have been received and reports of our work in North Dakota sent to him.

R. H. Waldschmidt, M.D., Chairman

Public Policy and Legislation

The Committee has very little to report this year, since not being a legislative year, there were no matters pertaining to legislation presented to us. However, we had a meeting on March 13 and 14 when the committee members of the North Dakota Council and presidents of the various societies met at Fargo, at which time the general subject matter of legislation was discussed.

If any members have any proposed legislation they would like to sponsor or hear of any that is going to be presented that would be of interest to the medical profession, we would be glad to have you get in touch with us.

Archie D. McCannel, M.D., Chairman

Public Health

The Committee on Public Health of the North Dakota State Medical Association met in Fargo, North Dakota, on April 10,

1948. Those in attendance were Drs. Orr, Huntley, Little, Brown, Weible, Beithon, Waldren, and Saxvik. Mr. Engebretson attended as a guest. The following resolutions were discussed and passed upon favorably:

1. The Laboratory Division of the State Department of Health should continue to do Rh factor typing on all serological specimens.

2. The State Medical Association should appoint a sub-committee of not more than five members consisting of doctors in the immediate area of the Missouri Valley Diversion Project and work with the State Health Officer in controlling the public's health.

3. That in order to protect the health of the people, particularly in the Red River Valley area and the Williston area (the beet raising areas of North Dakota), voluntary cooperation between the farmers and the State Department of Health be initiated to establish a system of health examinations to eliminate tuberculosis and other diseases. If this is inadequate, it will be necessary for this committee to seek legislation to empower the State Department of Health and local health authorities to enforce such steps necessary to protect health.

It was brought to the attention of the group that a marked increase in reports of amebic dysentery has been noted, particularly in the middle section of the state. It was reported by Dr. Saxvik that since the Health Department does not have a parasitologist, one has been requested from the U. S. Public Health Service to come to the state in order to investigate this situation. The State Health laboratories and engineers will be available to work with the parasitologist so that as complete a study may be made as possible. The results of this study will, of course, be made available to physicians in North Dakota.

R. O. Saxvik, M.D., Chairman

Venereal Disease

The meeting of the Committee on Venereal Disease was called for April 10th for various reasons. None of the members were able to be there. Your Chairman met with the State Health Department and talked over various problems that had come up in recent months. A change in the recommended schedules for treatment connected with the hospital bed program increased the total amount of penicillin to be given in schedules two and three from 2,400,000 to 4,800,000 units. This is in keeping with the nationwide experience with penicillin.

We are informed that the United States Public Health Service offers a $4,000 grant for a special venereal disease program designed to increase efficiency of the work and also educate the doctors and public. The objectives of this program would be as follows:

1. To increase case finding services by the assignment of personnel to selected communities and districts of the state.

2. Education of the public by the utilization of available methods and materials of the state and the U. S Public Health Service.

3. Education and consultation with private physicians regarding venereal disease by the orgainzation of venereal disease institutes and a venereal disease information service.

Dr. Saxvik was asked to develop such a plan and submit it to the Committee on Venereal Disease for approval, and if approved, we would recommend that the North Dakota State Health Department request this grant. A brochure for the private practitioner explained in brief the various stages of syphilis and schedules of treatment were worked out by the Health Department. This brochure was approved for distribution among the doctors of the state.

The public health figures of the past year show a marked increase in the number of primary and early syphilis treatments as compared with the late type. This is almost a reversal of the syphilis formerly seen and is encouraging.

Frank I. Darrow, M.D., Chairman

Crippled Children

The Committee on Crippled Children of the North Dakota State Medical Association, together with the Medical Technical Advisory Committee, Division of Child Welfare, met in Bismarck, North Dakota, January 3 and 4, 1948.

A brief report on the scope and operations of the North Dakota Crippled Children's program under the present state plan with emphasis on case-finding, diagnosis, treatment and follow-up care follows. It is believed that case-finding in North Dakota is good. The Crippled Children's Service (CCS) of the Child Welfare Division of the Public Welfare Board receives referrals from a wide variety of sources, the greatest number coming from social workers, nurses, physicians, hospitals and teachers. Occasionally, children with handicapping conditions other than those which are listed as treatable under the present state plan are reported to the Child Welfare Division. In such instances, the names of the children are placed on the physically handicapped register and referral is made to other agencies or organizations that may have the resources to furnish the needed care.

Diagnostic service is provided for at the itinerant spring clinics and, throughout the year, at the home offices of physicians authorized to participate in the program. Free diagnostic service is provided for all children under 21 years of age having a suspected crippling condition other than eye or ear deformities. In the latter two instances, children are admitted to CCS only if a prior examination indicates surgery is needed.

Conditions not treatable under the present state plan are: defective hearing (except when ear surgery is required), defective vision (except when eye surgery is required), speech impediment, epilepsy, and chronic diseases such as rheumatic fever, diabetes, nephritis, etc.

The Child Welfare Division has maintained a register of physically handicapped children for approximately two decades. During the past ten years, such registration has been adjusted to the requirements for obtaining federal funds to aid in the operation of CCS. There are 3,492 children on the register.

Attention was called to the fact that the North Dakota Crippled Children's Program is based 100% on the principle of using existing private resources and that where such resources are inadequate, an effort is made to stimulate their development on a private basis. In short, the program is a subsidy to the existing pattern for provision of medical care, rather than a substitute, as is the case where the state builds a program around a central hospital with a specialized staff.

Since there are no licentiates of the National Board of Plastic Surgery practicing in North Dakota, and since it is known that some surgeons in North Dakota have a special interest in plastic surgery and are performing such surgery with excellent results, the secretary asked that some method be devised to select such surgeons and authorize their participation in the CCS program.

A motion was adopted that all surgeons in North Dakota who wish to participate in the program by performing plastic surgery under the Crippled Children's Service plan will submit their qualifications in writing for approval by a committee to be appointed by the Technical Medical Advisory Committee.

The clinic for spastics which was put on at Jamestown by the North Dakota Chapter of the Society for Crippled Children and Adults and on which Dr. M. A. Perlstein appeared, was sponsored by the Crippeld Children's Committee of the State Medical Association.

A. R. Sorenson, M.D., Chairman

REPORTS OF SPECIAL COMMITTEES

The following reports of Special Committees were referred to the Reference Committee to Consider the Reports of the President, Secretary, and Special Committees, with the exception of the report of the Committee on Emergency Medical Service, which was referred to the Reference Committee to consider the Report of the Committee on Emergency Medical Service:

Industrial Health

State and local health departments in North Dakota are planning cooperating with the Workmen's Compensation Bureau to make a survey of all industries in the state, not only those in the larger cities, but also those in the smaller cities and rural areas. This is perhaps the first time in the United States that a state has undertaken a survey of rural industries.

General information, such as the number of man-days hired by the farmer plus sanitary questions, such as water supply, waste disposal, and rodent control will be entered on a data card. Medical information to be recorded will include the availability of medical and hospital service, health and accident insurance, and the amounts and kind of illness which the family and employees have had in the past five years. The number and kinds of accidents which have occurred on the farms in North Dakota will be included in the record. Potentially hazardous work such as feed grinding, treating grain with chemicals and the use of insecticides will be included.

The Council on Industrial Health in the American Medical Association continues to be very active and your Committee is in accordance with their aims and purposes.

C. J. Glaspel, M.D., Chairman

Emergency Medical Service

Your chairman attended the meeting of the Council on National Emergency Medical Service at the headquarters of the American Medical Association on April 5th and 6th, 1948, in Chicago. This meeting was roughly divided into two main themes. The first pertained chiefly to civilian defense; the second pertained to military defense. Speakers of national importance addressed us on both subjects. The motivating cause for the calling of this meeting was the presence of a national critical situation due to our strained relations with Russia. The possibility of war looms ominously. We are not in any sense of the word prepared for hostilities except that we do have the atomic bomb at a threat against an aggressor. We do not know if Russia has one perfected. In all probability, the Russians are capable of promoting chemical and bacteriological warfare, plus the warfare of World War II type. We probably would not fight until attacked and then the results might be like Pearl Harbor only more devastating and they would probably be directed against the home land. Civilian defense becomes a prominent issue. As a matter of fact, its importance is of such a magnitude that there has been created on the same level as the Secretary of the Army, Secretary of the Navy and the Secretary of the Air Force, the office of the Director of Civilian Defense, headed by Mr. Hopley of Omaha, Nebraska. It is assumed that a similar office will be established in several states, and the medical professions allied with other professions dealing with health and medical care will be an integral part of that committee.

At the time of the meeting in Chicago, North Dakota had no state organization set up for an emergency. It is likely that one will be, and it suggested that a committee or representative of the State Medical Association be appointed to be recommended to the Governor when the organization is set up. It would be theirs or his duties to both advise the State Committee on Civilian Defense concerning medical and health problems and also act as a coordinator and general advisor to the local civil defense committees. Specific details can only be worked out at future dates as the program crystallizes.

It was apparent at the meeting that a bolstering of the armed forces is only a matter of time. It may have been initiated by the time our state meeting has convened. There is little doubt but what Selective Service will again be inaugurated. The fate of U.M.T. at this time is uncertain. The rough draft of a Selective Service law has already been prepared and was placed in the hands of the Committee on Military Affairs on April 2, 1948. At this time, sentiment is such that early passage will be assured. This will immediately create the problem for the medical profession. Local board examining physicians must be appointed. Medical advisory boards will come into being.

In the original form, a special clause pertains to the drafting of doctors, dentists, and veterinarians between the ages of 18 and 45 years by presidential order upon the request from the secretaries of the various components of the armed forces. Doctors who are not married and between the ages of 18 and 26 years and who are not veterans will be subject to the same provisions of the draft as anyone between the ages of 18 and 26 years. In addition, those doctors holding reserve commissions or in active U. S. commissions or who are in the National Guard are still members of the armed forces and subject to call by the armed forces whenever they deem necessary. This then means appointments to local boards and medical advisory boards should be made from the members of the profession over 45 years of age if possible. It of course is absurd to think that all doctors under 45 years of age will be inducted or recalled to duty. There must be sufficient numbers left to adequately care for civilians. It is possible that the determination will probably be made through the National Security Resources Board or some sub-committee of the board. Nevertheless, the State Association should make such an inventory of its members to determine the number and type of doctors to be retained for civilian needs. It is recommended that such a survey be accomplished as soon as possible. Close cooperation in this respect with State Selective Service is highly desirable.

A. C. Fortney, M.D., Chairman

Nursing Education

There having been no urgent problems presented by the Nurses Association this year, your Committee on Nursing Education has not met. Your Chairman, however, has been kept in touch with the nursing situation through the state office. A representative of the state office has attended numerous nursing group meetings.

G. W. Toomey, M.D., Chairman

Mental Hygiene

The Committee on Mental Hygiene met at the North Dakota State Hospital, Jamestown, North Dakota, on April 2, 1948. The following resolutions were discussed and passed upon favorably:

1. We have especially felt the need of a comprehensive psychometric program carried out through a county plan, by competent psychometrist. There are many ways in which this could be approached, but the basis of the suggestion comes from the fact that patients are committed to our mental institutions without any such test being made. At least several thousand who should properly be tested as mentally deficient are receiving very little supervision in this state, either in their school work or in their social life. The final result is that commitment is made to our state institutions only in those cases which are potential trouble-makers in family life, in the schools or in the community.

2. Approximately one-seventh of the mentally deficient and epileptic in North Dakota are committed to our mental institutions. This is based upon an estimate of one to two per cent of mentally deficient and epileptic in our general population. It is improbable that institutional building can ever keep pace with the need of special education for this group. We feel, therefore, that the public school system, so far as possible, should undertake the education of the retarded child through special teachers. This is being done in a limited way only, in our larger cities.

3. We urge that special attention should be given to retardation and mental deficiency in each county through well balanced welfare work. If this can be done under supervision of the Public Health Department, through the division of mental hygiene, it would seem to be the best approach.

4. That it must be realized that one out of every ten persons suffers from some form of mental or emotional maladjustment.

5. That to attempt to remedy this situation our medical school should be encouraged to place more emphasis on training students in this field, and to recognize and teach psychiatry as a basic science; thereby preparing medical students to become well rounded physicians.

6. If a medical student is to become a well rounded physician, he must realize in the process of his educational experiences that psychiatry is an integral part of medicine, and that understanding of a patient's emotional life is quite as important as the knowledge of anatomy and physiology in making a correct diagnosis in carrying out the treatment.

7. Realizing that a great shortage of physicians, psychiatrists, nurses, trained attendants and other medical workers exists, we strongly urge that our society cooperate with the National Mental Health Act in a broad long-range program for the improvement of mental health of our state and nation.

A. M. Fisher, M.D., Chairman

Report of the Delegate to the American Medical Association

Your Delegate to the American Medical Association begs leave to submit the following report of the meeting held at Atlantic City, June 9 to June 13, 1947.

This convention, celebrating the 100th anniversary of the establishment of the American Medical Association was unique in many ways. More than 60 distinguished guests, representing scientific progress in various medical specialties throughout the entire world, were invited guests as representing the medical profession in their respective countries and an honorary fellowship was awarded to each of these distinguished physicians. It might be interesting to note that several of these physicians who attended were ambassadors of their government to the United States. The delegation from the British Medical Association included the chairman of their council, the secretary, the editor and the chairman of their Committee on Internal Relations. The delegate from China presented to the House of Delegates a scroll painted on silk with a tribute to the advancement of medical science as a result of the efforts of American medicine. Many of the representatives of foreign governments presented brochures and scrolls especially prepared for the occasion. Denmark presented a medical book published in the earliest day of printing. From Switzerland a medal especially designed to commemorate the occasion and every representative presented a special resolution from their country, congratulating the Association on 100 years of medical progress. Much credit for the outstanding success of this meeting was due to the long and careful planning by the Board of Trustees, the Centennial Committee, and the Headquarters Staff of the Association. The registered attendance of 15,667 represented the largest assemblage of physicians ever held anywhere in the world.

Unquestionably first in recognition by the Fellows of the Association was the scientific exhibit. The consensus of opinion was that these exhibits might be available throughout the year for graduate study in other parts of the country.

The general medical meetings were held in the great ballroom of the Atlantic City Convention Hall, which seats 6,000 persons, and it was taxed to its capacity at all meetings.

The House of Delegates were in continuous session from June 9 through June 12, so the only opportunity your Delegate had to attend the scientific exhibit was one morning.

The problem most prominently confronting the House of Delegates concerned the future of the general practitioner, the reorganization of staffs of hospitals to provide for service in general practice, the utilization of the total medical profession for any future military emergency, plans for promotion of voluntary insurance against the cost of sickness and hospitalization, and the provision for a supplemental meeting of the House of Delegates during the winter months.

Senator James E. Murray tried to divert the publicity interest from the advancement of medical science to his campaign for socialization of medicine. Inadvertently, his publicity material was sent directly to the officers of the Association, which gave the House of Delegates an opportunity to reply directly to Senator Murray and unanimously express its opposition to his proposal.

The Executive Session was almost entirely concerned with the final report of an interim committee on the public relations of the A.M.A. This activity is now well co-ordinated and the coming year should see it functioning well.

At the supplemental session of the House of Delegates in December, 1946, a special committee for the consideration of the Rich Report (which had to do with public relations) presented its conclusions, with the exception of that portion pertaining to the National Physicians Committee, which it reported needed further study. This committee reported at the Atlantic City session and their conclusions should be of vital interest to this House of Delegates. They were as follows:

1. Accusations of financial transactions of "unsavory character" have not been substantiated by fact.

2. With regard to the question of interlocking trusteeship, your committe has, in its December report, expressed its view: "This committee recognized: that each member of the A.M.A. is primarily a citizen with the inalienable rights to join any organization." As a result of its recent study the committee reiterates this statement.

3. In view of the presently incomplete development of the public relations program of the A.M.A., there is still a very definite need for continuation of the National Physicians Committee and other organizations established for similar purpose.

4. Even with a fully developed public relations program by the A.M.A. along lines as presently planned, there will, in all probability, still be a place for the National Physicians Committee for many years to come.

5. Your committee recommends that the House of Delegates of the A.M.A. repeat its commendation of two previous occasions on the accomplishments of the National Physicians Committee and resolve a vote of confidence in the managing board of that organization.

6. Last December this committee recommended to the House of Delegates that "in line with the new program in the process of accomplishment this committee feels that the A.M.A. should and must do its own public relations and legislative work." It reiterates that recommendation at this time and further recommends appropriation of adequate funds for implementation of a definite program under the guidance of a public relations consultant who will work harmoniously with all A.M.A. agencies.

7. To accomplish this last recommendation, your committee further recommends that adequate changes be made in the Public Relations Department.

This resolution was adopted and carried.

The Distinguished Service Award of the A.M.A. was awarded to Dr. Henry A. Christian of Boston.

Dr. R. L. Sensenich who has devoted many years of unselfish service to the A.M.A. in his capacity first as Delegate from Indiana, then as a member of the Board of Trustees and for the past three years as chairman of the Board of Trustees, was unanimously elected to the office of President-Elect.

The regular meetings of the House of Delegates were characterized by harmony and very efficient handling of an enormous amount of routine business necessary to the smooth functioning of the Association at a whole.

The House adjourned *sine die* at 4:30 o'clock P.M., June 13, 1947.

A. P. NACHTWEY, M.D., (Deceased)
Delegate to the A.M.A., 1947

Report of the Delegate to the Interim Session of the House of Delegates of the American Medical Association

(Cleveland, January, 1948)

Your delegate submits the following report:

As a freshman delegate, it was probably fortunate that my initiation to the House of Delegates of the American Medical Association occurred at an interim session. I was present before the Speaker called the House to order for the first session, attended all the sessions of the House and was present when the House adjourned *sine die*. There was so much to learn that I did not even get to the auditorium, where the scientific sessions were held.

I can only give you first impressions of such an important legislative body; but those impressions may be confirmed by subsequent sessions of the House.

The first is that the House of Delegates takes its responsibilities very seriously. There were 176 eligible delegates. At the first session 145 were in attendance and, at an executive session, 168 were present.

The reference committees handle a tremendous amount of work in what appears to be a limited amount of time, but the hearings they hold are open to any accredited representative and debate in these committee meetings is highly informative. When the reports of the various reference committee were presented to the House for action, they were discussed very thoroughly and some of them, at great length. I do not know what the general tendency has been in previous sessions of the House but I got the distinct feeling that the House of Delegates proposes to take over much more control of the Association than may heretofore have been the case. It was not in a mood to delegate authority.

Policy-making should be much more in evidence at the annual meeting in Chicago in June, 1948. The trends which I think I detected in Cleveland were:

1. A greater development of non-profit medical care plans. Opinion is by no means unanimous on how these plans should be developed but Associated Medical Care Plans (AMCP) seems to be functioning rather effectively as a clearing house for the various plans that are either in operation or in process of formation. The presence of Blue Cross in this picture was a bit confusing, not because it was in the picture but because a number of delegates doubted the place it should occupy in the development of non-profit medical care plans.

2. A greater interest in the Taft bill. This did not officially come to the floor of the House but a number of delegates reasoned that since it embraces the voluntary principles of health insurance and the decentralization of authority, the direct antithesis of the Wagner-Murray-Dingell bill, it should have more tangible support; and that any objectionable features in the Taft bill would not be too difficult to eradicate.

3. Increased objection to the "practice of medicine" by hospitals. This is an involved subject. Primarily, it deals with the status of radiologists, pathologists and anesthesiologists in hospital practice and the exploiting of their services for profit by the employing hospitals. While resolutions, dealing with various phases of these problems were not passed, the subject is a live one.

4. Emphasis on the need for improving rural medical care. This came up in the House and, of course, was the subject of a "grass roots" conference, which I attended. In simple honesty, I must state that no one has a solution for this problem other than to state that it is an "individual matter" and that each state will have to work out its own solution. The House of Delegates did create a committee to study ways and means of interesting interns in general practice. While this was being discussed it did occur to your delegate that a number of the good general hospitals of North Dakota had much more to offer an intern by way of training for general practice than many of the large urban hospitals where, due to the presence of a multitude of residents and fellows, the intern has been crowded into the position of a not-too-glorified orderly. I could list a number of North Dakota hospitals where sound, basic training could be obtained in medicine, surgery and obstetrics. These still remain the basis of general practice. If the intern takes his training in such a hospital, isn't he more likely to retain or develop an interest in general practice?

I anticipate that the Chicago session in June 1948 will be a busy one. I have not touched on the World Medical Association, in the organization of which the A.M.A. took such an active part nor in the interest which was shown in organizing for civilian medical care in the event of another war. These, and many other problems are on the agenda.

John H. Moore, M.D.,
Delegate to the A.M.A., 1948.

The Medical Center Advisory Council

This is the third annual report I have submitted to the House of Delegates of the North Dakota State Medical Association on the activities of the Medical Center Advisory Council as the representative of the North Dakota State Medical Association. I was elected as your representative to this Council at the meeting in Valley City in May, 1945, for a three year term. This report will, therefore, mark the end of the term to which I was elected.

In my two previous reports, I have gone into considerable detail regarding the development of the North Dakota Medical Center, the activities of the Medical Center Advisory Council and the enabling and permissive legislation which was passed by the North Dakota Legislature in 1945 and in 1947. It is not necessary to review these matters in this report, particularly since the news letter of our efficient Executive Secretary, Mr. E. F. Engebretson, under date of January 16, 1948, contained a six-page report on "The Plan for Activating the North Dakota State Medical Center." This report, prepared by the Director of the North Dakota State Medical Center, Mr. John A. Page, at the request of Mr. Engebretson, covered in question and answer form all of the important problems concerning the Medical Center.

The Medical Center Advisory Council has continued to hold its regular meetings as required by law and your representative has been in attendance at all of them. The last regular meeting was held in January 1948 and was devoted to the consideration of ways and means to get the North Dakota State Medical Center plan before the people of North Dakota by means of an educational campaign so that they can vote intelligently on the proposal to amend the Constitution of the State of North Dakota to permit the levy of one mill on all taxable property of this state. This proposal will be upon the ballot in the November 1948 general election.

The issue, therefore, is to be placed squarely before the electorate of North Dakota, which is as it should be. In recent years I have heard various "health plans" discussed in this state by various groups. Not until the Medical Center plan was developed and given legislative approval has there been any plan which would help to solve our problem. That problem lies, primarily, in the field of Medical Education; not only in the education of doctors to practice in North Dakota but in the education of nurses, technicians, dietitians and other related fields. It has been repeatedly stressed, here and in meetings of medical educators throughout the nation, that if a state is to insure adequate medical care for its people, it must provide education for such care within its own borders. With the decentralization of the teaching and hospital program, which the plan emphasizes, North Dakota physicians and North Dakota hospitals will play the leading part in developing such a program to the point where it will reflect great credit on them, for they will be leaders in a plan which has for its major objective better health for all of the people of North Dakota.

The North Dakota State Medical Association has officially endorsed this program on numerous occasions. I now urge each individual physician to actively work for a "yes" vote on the proposed constitutional amendment next November.

John H. Moore, M.D., Member

New Business

The Speaker called upon Dr. Williamson, Secretary of the State Board of Medical Examiners for more than forty years, for a few remarks. Dr. Williamson explained the ever-present goal of the Board to be the securing of highly qualified doctors for the State of North Dakota.

Dr. Wright asked the privilege of the floor to introduce Mr. Frank Smith, Director of the Associated Medical Care Plans, Chicago, Illinois, informing the House that Mr. Smith was present to act in any capacity in aid of explanation of Prepayment Insurance. Mr. Smith made a few remarks explaining the background and the purpose of his organization. Dr. Wright also introduced Mr. Don Eagles, the Director of the Blue Cross Program in North Dakota, who was present for the same purpose.

Nominating Committee

The Speaker announced the appointment of the following members to the Nominating Committee: Drs. O. A. Sedlak, chairman, C. J. Meredith, J. C. Fawcett.

In this connection the Speaker announced that he had a letter from Dr. Moore, who indicated that he did not wish to be reappointed as representative to the Medical Center Advisory Council. Consequently the Speaker instructed the Nominating Committee to nominate a new representative.

Adjournment

The First Session of the House of Delegates was adjourned to reconvene at 1:30 P.M., Sunday, May 23, on motion of Dr. Halliday, and seconded by Dr. Gilsdorf. The motion was carried and the first session adjourned at 9:00 P.M.

SECOND SESSION OF THE HOUSE OF DELEGATES

Sunday Afternoon, May 23, 1948

The Second Session of the House of Delegates was called to order by the Speaker, Dr. A. P. Nachtwey, at 3:00 P.M., in the Dining Room of the Gladstone Hotel, Jamestown, North Dakota, May 23, 1948.

The Secretary called the roll. Eighteen delegates responded and the Speaker declared a quorum present. The following delegates were present: Drs. A. C. Fortney, Fargo; H. B. Huntley, alternate, Kindred; W. R. Fox, alternate, Rugby; R. E. Leigh, Grand Forks; T. Q. Benson, Grand Forks; C. J. Glaspel, Grafton; J. D. Craven, Williston; A. R. Sorenson, Minot; E. J. Larson, alternate for Richland District Society, Jamestown; W. H. Gilsdorf, Valley City; R. B. Radl, Bismarck; C. C. Smith, Mandan; F. W. Fergusson, alternate, Kulm; R. W. Rodgers, Dickinson; W. W. Wood, Jamestown; E. J. Schwinghamer, New Rockford; O. A. Knutson, Buxton; D. J. Halliday, Kenmare.

The reading of the minutes of the first session was dispensed with on motion of Dr. A. C. Fortney, which was seconded by Dr. R. E. Leigh, and carried.

Election of Officers

Dr. C. J. Meredith, acting chairman of the Nominating Committee, presented the following report. Speaker announced that there was nothing in the report of the committee that precludes additional nominations of officers from the floor and inquired as to whether any additional nominations were to be made. Hearing none, he declared that the motion would be in order to declare the nominees duly elected to their respective offices. On a motion that the nominees be elected unanimously, which motion was seconded all voted Aye, and the officers were elected unanimously.

President—W. A. Liebeler
President-Elect—W. A. Wright
First Vice-President—L. W. Larson
Second Vice-President—W. E. G. Lancaster
Speaker of the House—A. P. Nachtwey
Secretary—O. A. Sedlak
Treasurer—E. J. Larson
Delegate to A.M.A., 1949—John H. Moore
Alternate Delegate—G. W. Toomey
Member of the North Dakota Medical Center Advisory Council—L. W. Larson
Councillors:
  Fourth District—A. D. McCannel
  Fifth District—C. J. Meredith
  Ninth District—E. J. Schwinghamer
State Board of Medical Examiners:
  O. W. Johnson, Rugby
  O. A. Sedlak, Fargo
  R. B. Radl, Bismarck

Selection of 1949 Meeting Place

The Speaker announced that he would be glad to entertain an invitation for a place for the 1949 meeting to be held. Dr. A. R. Sorenson stated that the Northwest District Medical Society will be very glad to entertain the Association next year in Minot, North Dakota, stating that Minot is now very well equipped to take care of such an Annual Meeting. It was moved by Dr. H. B. Huntley, seconded by Dr. R. W. Rodgers and carried that this invitation be accepted.

REPORTS OF REFERENCE COMMITTEES

Reference Committee to Consider the Reports of the President, Secretary and Special Committees with the Exception of the Committee on Emergency Medical Service

Dr. A. R. Sorenson, Chairman, presented the following report, which was adopted section by section and as a whole:

1. *Report of the President.* The report of our President has some very pertinent recommendations which your Reference Committee believes should be considered by the House of Delegates at this meeting. The first of these I quote from his report:

"I thought best to appoint the active officers of the State Association (President, Secretary and Treasurer), together with the executive members of the Council (McCannel, Sorkness and Waldschmidt). I would further recommend that the Councillor residing in the district of the President of the Auxiliary be a member of this Advisory Council."

"It has been the custom of the Governor to appoint the incoming President to the State Health Planning Committee. This arrangement seems to me to be a waste of effort as it takes about a year to know what it is all about. I suggested the reappointment of Dr. Spear, a most capable representative, a man who was conversant with all the details. The Governor agreed with this arrangement. I would suggest this be continued if the genial doctor is willing to carry on."

With regard to the appointment of a member to the State Health Planning Committee by the Governor, this Committee would recommend that the appointment be recommended to the Governor by the governing body of this Association such as the Council, with the point in view of having a suitable person receiving the appointment.

This Committee would like to express the appreciation of the State Medical Association to President and Mrs. Arzt for the splendid work they have done in organizing the Woman's Auxiliary. This has required much effort and persistence on their part and will exist as a monument in their honor.

On behalf of the Association, may we express to President Arzt its appreciation of his administration well done.

2. *Report of the Secretary.* Your Reference Committee has carefully reviewed the report of your Secretary, Dr. Sedlak. This is his first year in office and he is to be commended for the good report and for the time and effort he has spent in making contacts outside the state with various medical organizations. Your Reference Committee feels that the two recommendations he makes, namely:

(1) More careful action in budgeting the Association funds and providing for the increasing expenses of the Association in the future as was recommended by the Executive Secretary, Mr. Engebretson; and
(2) An amendment to Chapter 9, Section 6, regarding retired members and members living out of the state but still associated with the North Dakota State Medical Society;

should be taken up by the House of Delegates and some action taken on these recommendations.

3. Report of Committee on Industrial Health.
4. Report of Committee on Nursing Education.
5. Report of Committee on Mental Hygiene.

A. R. Sorenson, M.D.
W. W. Wood, M.D.

Reference Committee to Consider the Reports of the Council, Councillors, Delegate to the A.M.A., and Member of the Medical Center Advisory Council

Dr. D. J. Halliday, Chairman, presented the following report, which was adopted section by section and as a whole:

1. *Report of Chairman of the Council.* Your Reference Committee has carefully considered the report of the Council as submitted by Dr. McCannel. It feels that a vast amount of work has been most efficiently accomplished through their untiring efforts.

The Committee would suggest that the Executive Secretary submit a financial statement for the current year, to be added as a supplemental report for the consideration of this Reference Committee. In this way his report and that of the Treasurer would both be current.

The Reference Committee recommends the adoption of the following resolution, as submitted by the Council:

1. That the House of Delegates give careful study to the needs of increasing the annual dues to $50.00 per year, due to the fact that the demands of our budget are greatly increasing; this increase being due to the travel expenses of members of various committees and the fact that there will be an increased expense in connection with the coming legislative session.

   The annual registration fee of $3.00 at each convention will be eliminated.

In connection with the adoption of this resolution relative to the increase of dues, it was pointed out by Dr. Halliday that in the past many of the members of the Association who have attended national meetings on Association business have paid the expenses out of their own pockets. Further, that as the business of the Association increases, it is necessary for more and more men of the Association to attend such meetings. He stated that "We feel it is time that these expenses be paid by the Association, and therefore this will add to the expenses of running the Association. We need more funds for this purpose. We have brought this up as a recommendation by the Reference Committee to bring this before the House of Delegates."

After considerable discussion, the recommendation of the Reference Committee was changed to read as follows:

1. That the House of Delegates approve an increase in the annual dues to $50.00 per year, due to the fact that the demands of our budget are greatly increasing; this increase being due to the travel expenses of members of various committees and the fact that there will be an increased expense in connection with the coming legislative session.

   The annual registration fee of $3.00 at each convention will be eliminated.

The Reference Committee moves the adoption of the following amendment to the By-Laws as submitted by the Council:

> That the Annual assessment for resident members who have retired from the practice of medicine, and non-resident members who have retired and who do not stay outside the state of North Dakota for a period in excess of two years, shall be $10.00 per capita unless otherwise ordered by the House of Delegates.

The Reference Committee moves the adoption of the following recommendation from the Council:

> That the House of Delegates give their earnest study to the recommendations of the Committee on Prepayment Medical Care.

The Reference Committee moves the adoption of the following recommendation from the Council:

> That the contract for the Journal-Lancet be renewed for one year, provided this is acceptable to the Journal-Lancet.

2. *Report of Councillors.* Your Reference Committee moves the adoption of the reports of the Councillors. All groups report a much healthier condition, such as more frequent meetings, increased attendance and presentation of more scientific papers.

The Committee has noted the inactivity of the Richland County Society and would urge them to make further efforts to hold meetings.

3. *Report of the Delegate to the American Medical Association.* D. J. Halliday: Your Reference Committee moves the adoption of the report as submitted by Dr. Nachtwey, Delegate to the A.M.A. He has worked most diligently and is to be commended for his faithful work in behalf of the Association. The Committee is also pleased to move the adoption of the report of the Interim Session of the House of Delegates of the A.M.A. as submitted by Dr. John Moore.

4. *Report of the State Medical Association's representative on the Medical Center Advisory Council.* Your Reference Committee has considered the report of the Medical Center Advisory Council as submitted by Dr. John Moore.

The Committee recognizes the scarcity of doctors in the state, the difficulty of inducing doctors to come to North Dakota, and the problem of the North Dakota youth gaining admission to an out-of-state medical school. It is, therefore, in agreement with the proposal of this Council that active support be given by the individual physicians to secure the passage of the Constitutional Amendment to increase the mill levy in the state, whereby funds will be available for an adequate medical school at the University of North Dakota.

D. J. Halliday, M.D.
W. H. Gilsdorf, M.D.

Reference Committee to Consider the Reports of the Standing Committees Except the Report of the Committee on Medical Economics and its Sub-Committees on Prepayment Medical Care, Veterans Medical Service, and Rural Health

Dr. R. E. Leigh, Chairman, presented the following report, which was adopted section by section and as a whole:

1. *Committee on Medical Education.* Your Reference Committee has the following comments to make upon the report of the Standing Committee on Medical Education. It recognizes the general correctness of the report and the potential desirability of its ambitious program for the future of medical education in the state.

Your Medical Education Committee report is, however, remiss in that it does not stress the serious state of affairs at the medical school. Your Committee refers to the financial difficulties that have contributed to the standing, or rather the lack of standing of our school. It refers also to the proposed one mill levy. It would seem proper to review some salient factors in the school's decline.

The school was removed from the accredited list of the Association of American Medical Schools about sixteen years ago. Its other ratings were lost in 1938 and it went on a probationary status. This probation has continued from year to year. There are many factors that have contributed to the school's distress, the main one being financial. The continued operation has been permitted because the factors of the depression and war were taken into consideration by the rating bodies. Where to put the blame for the straits of the school is difficult. True, the legislature was hard pressed to provide money. However, in several years during the probationary period, funds have been returned to the state jackpot from the medical school. The present biennium the Legislature appropriated $110,000.00, or $55,000.00 per year in addition to the appropriation for a building which fund was raised to over $400,000.00. This building is now under construction. The fact that a new building had been authorized plus the obtaining of Dr. Lawton as Dean gave the school a new lease of life one year ago. (Dr. Lawton has resigned, to become effective July 1, 1948. His successor had not been selected as of May 20th.)

Much stress has been put on the need of a one mill levy for the medical school, but no explanation has been forthcoming as to the significance of its passage. There is a general impression that it will create sufficient funds to establish a four-year medical school and hospital at Grand Forks. This is not true nor is it in the plans of the Administration of the University or the Board of Higher Education. At present, North Dakota has the lowest operating budget of a two-year school, $55,000.00 per year; next lowest school is South Dakota with $125,000.00. It is estimated in average times that $250,000.00 per year is the minimum sum needed to operate a good, well-equipped and well-staffed two-year school. The staff item may be injected into the discussion at this time. We all know the minimum time required to produce a novice physician is eight years; three years college; four years medical school; one year internship. That novice today has a high market value for general practice. To get an M.D. with necessary postgraduate training to qualify him to teach means an additional three to five years study. This makes him an extremely expensive person; $10,000 per year is not considered a high salary for such a man.

President West of the University of North Dakota analyzes the situation as regards the mill levy as follows (this also, I believe, reflects the thinking of our Board of Higher Education):

1. The mill levy will or will not pass. (a) If it does not pass the people do not wish any great expansion in our school; for example, an attempt to create a four-year school. (b) If it does pass, it will not be considered a demand for a four-year school but in order for the Board of Higher Education and Administration to survey and provide that which may be obtained with the funds so available.

2. The North Dakota governing bodies have always been conservative. The Board of Higher Education has never stampeded into strange fields. (a) Therefore, if the mill levy does not pass, it will be interpreted as an order by the people to go before the Legislature (which appropriated over one-half million dollars last year) for funds to continue operation of a two-year school. The Board of Higher Education and the Administration of the University realizes that our two-year school must be saved.

3. If the mill levy passes there will be no hospital erected at Grand Forks or any other place with the funds so provided.

4. If the bill passes and any expansion is indicated or possible, existing local and state hospitals will be used.

5. The demands to receive an accredited rating as a two-year school are: (1) Adequate budget to insure a consistent qualified faculty; (2) Adequate housing and equipment; (3) A medical library housed and run by a qualified librarian and assistant.

This being accomplished, North Dakota can continue to accept from 25 to 30 students per year for basic training.

The question arises: can two-year students be transferred? The answer is, Yes. A survey by Dr. Lawton revealed placement for several times as many as North Dakota could graduate. Also there are several schools, such as Dartmouth, that plan to continue operating on a two-year basis.

A good accredited two-year school can serve the needs of North Dakota and the following are some of the possible rewards in addition to training students.

1. Present an improved pathological service to the doctors and small hospitals of the state.
2. Provide state toxicologist.
3. Provide reference library service.
4. Make short refresher courses and postgraduate training possible.

5. Augment nurses training to provide a degree in the nursing specialties.
6. Train laboratory technicians.
7. Provide consultation services for our state hospitals, such as Jamestown and Grafton. This will be possible as teaching clinicians are now being used in preclinical years.
8. Coordination services to help accredited hospitals for intern training. This service is one that will help provide more doctors for North Dakota.

A one mill levy at the present time is estimated to produce about $500,000.00 per year. The State Legislature has provided approximately that sum in the past directly or indirectly. A mill levy will give a consistent source of funds and should build up a small cushion against hard times. In reality, the proposed mill levy is a replacement tax that is designated for a specific purpose. It must be levied and its funds must be allotted by the State Legislature.

The Reference Committee wishes to make the following recommendations:

Our Committee on Medical Education could and should function as a liaison committee between the State Association doctors and the Medical School, Board of Higher Education and the University administration. The Committee could and should inspect our school and provide constructive criticism and help to the administration.

The personnel of the Committee should not be composed of paid faculty members of the Medical School.

2. *Committee on Official Publication.* Your Reference Committee has reviewed the report of the Committee on Official Publication and moves its adoption.

3. *Committee on Necrology and Medical History.* Your Reference Committee moves the adoption of the Report on Necrology and Medical History. At that time the Speaker announced that the Chair would request the House of Delegates to rise for one moment in silent tribute to the members who have passed on. Thereupon followed a moment of silence, with all delegates and guests standing.

4. *Committee on Maternal and Child Welfare.* Your Reference Committee moves the adoption of the Report of the Committee on Maternal and Child Welfare.

5. *Committee on Pneumonia.* Your Reference Committee has reviewed the Report of the Committee on Pneumonia and moves its adoption.

6. *Committee on Cancer.* Your Reference Committee moves the adoption of the Report of the Committee on Cancer.

7. *Committee on Tuberculosis.* Your Reference Committee moves the adoption of the Report of the Committee on Tuberculosis.

8. *Committee on Fractures.* Your Reference Committee moves the adoption of the Report of the Committee on Fractures.

9. *Committee on Public Policy and Legislation.* Your Reference Committee moves the adoption of the Report of the Committee on Public Policy and Legislation.

At that time, Secretary Sedlak asked for the courtesy of the floor and read a telegram received from E. Vincent Askey, President, California Medical Association, as follows: I have a wire from the President of the California Medical Association in conjunction with public policy and legislation which I would like to read to the House:

"Governor Earl Warren of California in nation-wide broadcast Sunday night came out with program which boils down to compulsory health insurance and fair employment practices Act a la Wallace and insisted these items be included in Republican program this year. He is openly in the field for presidential or vice presidential nomination and carries strong California delegation which will have valuable trading privileges at Philadelphia convention starting June 21. If compulsory health insurance on state or national level is to be stopped it must be in Philadelphia while platform is being drawn. Urgently request you contact your Republican delegates and congressmen, advise them of Warren attitude and enlist their support in keeping compulsory health insurance out of party platform. Letter with quotations follows. Cannot be too urgent in this matter. Time is short and all help needed."

10. *Committee on Public Health.* The Report of the Committee on Public Health has been reviewed by your Reference Committee. We wish to call your attention to item three in this report and to urge along these lines, set forth in this paragraph, that the doctors in the Red River Valley and Williston areas be extra vigilant during the season when itinerant workers are in these areas. We move the adoption of this report.

11. *Committee on Venereal Disease.* Your Reference Committee has reviewed the report of the Committee on Venereal Disease and moves its adoption.

12. *Committee on Crippled Children.* Your Reference Committee has reviewed the report of the Committee on Crippled Children and moves its adoption.

R. E. LEIGH, M.D., Chairman
H. B. HUNTLEY, M.D.

Reference Committee Report on Committee on Medical Economics, including the Sub-Committees on Veterans Medical Service and Rural Health

Dr. J. D. Craven, Chairman, presented the following report which was adopted section by section and as a whole:

1. *Report of Committee on Medical Economics as a whole*: Your Reference Committee to consider the report of the Committee on Medical Economics as a whole submits the following report:

We urge the active support by our members of the following groups whose prime purpose is to protect our medical interests:

1. The A.M.A., particularly the Council on Medical Service.
2. The National Physicians Committee.
3. The Association of American Physicians and Surgeons.

A member physician appeared before your Reference Committee to protest that welfare rates, especially for hospitalization in his city, are inordinantly low. He suggested an increase in fees be recommended.

Dr. Schwinghamer stated that official action has been taken by his society, the Tri-County, suggesting an increase in welfare board fees.

In closing this report on the Medical Economics Committee as a whole, we wish to commend the Chairman, Dr. Wright, for his diligent efforts on behalf of the society. He has given freely of his time in attending five national meetings during the past year.

In this connection Dr. Wright made the following explanation regarding Welfare Board rates: "In the report it is stated that a discussion was held but it was decided not to request a general upward revision of the schedule at this time. The difficulty is, of course, that the Welfare Board has a legislative appropriation biennium and unfortunately they did not appropriate enough for this year. It is not likely that any change will be made before the next session of the Legislature. However, it is anticipated that they will allow for that in their forthcoming budget. We expect to have a conference with the Welfare Board in June."

Dr. H. B. Huntley was given the privileges of the floor and made the following statement on behalf of the AAPS: "Relative to the feature of the AAPS public relations, they have inaugurated a National Essay Contest for juniors and seniors in high school with very attractive prizes. I feel our state is passing up a wonderful opportunity to acquaint the people of the state with the physician and his aims. It occurred to me that this might be a good project for our Women's Auxiliary to take up, if our proper officials here would take it up with them. I think this would work nicely. I do believe that each District Society ought to establish an annual prize to get high school students interested in writing an essay on 'How American Medicine Affords the Best Protection in the World.' "

2. *Veterans Medical Service.* Your Reference Committee has reviewed the Report of Dr. Radl, Chairman of the Sub-Committee on Veterans Medical Service.

A joint meeting of representatives of this Society and the Veterans Administration was held this morning, May 23, 1948. Dr. J. I. Fitzsimmons of the Fort Snelling Branch Office, and Drs. Roy K. Quamme and B. W. Varco of the Fargo Regional Office were present.

The conference was a successful one and the Veterans Administration representatives again gave evidence of all willingness to assist us in our problems.

It is the combined recommendation of the joint meeting this morning and of this Reference Committee:

1. That the Veterans Medical Service Division continue in operation on the general plan which is now in effect.
2. That our present contract be re-negotiated as of July 1, 1948, with two important changes:
    - (a) That the administration cost percentage to the contractor be increased from the present 10 per cent to 15 per cent, the percentage to be subject to re-negotiation during the life of the contract.
    - (b) That a no-profit, no-loss clause be incorporated therein.

Other problems of mutual interest were discussed with the Veterans Administration representatives and it is believed that the program will be even more successful and that the financial deficit will gradually be erased.

At this time Dr. Wright asked the privilege of the floor for the purpose of introducing Dr. Varco of the Veterans Administration, Fargo Regional Office, Dr. Roy Quamme, the Chief Medical Officer for the Area, and Dr. Fitzsimmons, Assistant Chief Medical Officer for Branch No. 8, Veterans Administration, Ft. Snelling, Minnesota. All three doctors acknowledged shortly their introduction before the House of Delegates.

3. *Rural Health.* Your Reference Committee to consider the report of the Sub-Committee on Rural Health submits the following:

Your Chairman strongly favors the expansion of a prepayment plan on a service basis as a substantial factor in the providing of better distribution of medical care among rural areas.

In particular your Committee would like to have the House of Delegates give consideration to the authorization of this Committee's sponsorship of Health Councils.

J. D. Craven, M.D., Chairman
R. B. Radl, M.D.
E. J. Schwinghamer, M.D.

Reference Committee on Prepayment Medical Care

Dr. R. W. Rodgers, Chairman, presented the following report which was adopted section by section, and as a whole. Your Committee has given careful study to the Report of the Sub-Committee on Prepayment Medical Care. This represents the culmination of many years of study and effort on the part of the Economics Committee and its Sub-Committee on Prepayment Medical Care. The Society owes the members of this Committee a debt of gratitude for their untiring efforts.

We recommend the adoption of this report and further recommend that the Medical Economics Committee and the Sub-Committee on Prepayment Medical Care be authorized to proceed with the necessary arrangements with the existing North Dakota Physicians Service operating in Cass County, so that this plan may be extended on a state-wide basis. Any arrangements effected by this Committee should be presented to the Council for final approval.

There was considerable discussion in connection with this recommendation. It was pointed out by Dr. R. B. Radl, delegate for the Sixth District, that at its last meeting, the Sixth District instructed its delegates to favor the passage of a prepayment medical plan, but that the delegates were instructed that before such plan be instituted in the Sixth District it should be submitted to said district for final approval.

In reply, Chairman Rodgers indicated that it was the feeling of the Reference Committee that the question should not be left up to the individual district societies as this has been done in the past and it has resulted in the problem being put off for several years. He stated that the Cass County Plan had been satisfactory to the doctors in Cass County and that it was the impression of the Reference Committee that the Cass County Plan is the best plan and that the Reference Committee felt that it could make no other recommendation.

Dr. P. H. Woutat, Chairman of the Sub-Committee on Prepayment Medical Care, was asked to take the floor and delivered a short review and history of the prepayment field. He pointed out that the Committee had made thorough investigation of various commercial plans. He stated: "From our studies we are satisfied that the service type plan offered the patient the most in the long run and that this will work out better for both the medical profession and the patient. Difficulties have been arising in some states where they have the indemnity plans. In some of the eastern states where they have income limitations, they are constantly raising their income limitations. We have talked to insurance company presidents operating other plans. There is increasing activity in the prepayment medical field. However, they all gave me the impression that expansion along these lines will be slow. It would not pay for a commercial type plan insurance company to come in here and try to sell this policy because of the expense of selling. Sales in most indemnity companies are going slow because most of the men are not interested in getting out and selling these policies. All things considered, we felt that if we are going into this, it should be a service type policy."

Secretary Sedlak then asked for the courtesy of the floor and made the following statement: "I attended the first meeting at Valley City where this matter was brought up. I saw careful engineering brought up to divert this measure. I went home and did a lot of thinking. The next year it was brought up again and again it was diverted. However, I do feel that the State Association should have a broader view on this problem. I brought the matter up to the County Society and with the aid of Don Eagles, we suggested that this plan be inaugurated as a Cass County Plan. We started this plan in Cass County, called the North Dakota Physicians Service Plan, in the hopes that it would some day be adopted as a state-wide plan. During the years we have operated, we have paid all losses in full. The financial statement as presented March 31, 1948, shows a total reserve of over $21,000.00, after making every payment submitted to us. The doctors in Cass County are practically 100 per cent in back of it. We have found it very successful and hope it will continue. We also hope it will spread across the state as a state-wide plan."

In response to a question put by Dr. C. J. Glaspel, it was pointed out by Chairman Rodgers that 51 per cent of the doctors must belong to the plan before it can be put into operation. He further stated that it is hoped that a much larger percentage will sign up for the program. He stated: "I do not think it binds any individual society or individual member. If the Society decides not to participate, I do not believe the Society is bound to go into this plan."

At that time the Speaker announced that he would rule that in connection with the vote on this recommendation of the Reference Committee, any delegate voting "No" would not bind his particular Society. Any delegates voting "yes" would bind his Society.

The Speaker then called the Secretary to call roll for a vote upon the ruling of the Chair, instructing the Delegates that those who voted "Yes" would be upholding the ruling of the chair and those who voted "No" would be challenging the ruling of the Chair. Secretary Sedlak called the roll by Delegates. The Speaker announced that the result of the ballot is ten "No" and seven "Yes" and declared that the Chair had been over-ruled. The question was then put to vote on the resolution.

Before the vote was called, Dr. Wright made the following statement: "There is absolutely no intention on the part of anyone to promote and ram this plan down anyone's throat. We understand that the present By-Laws are so set up that 51% of any district society will have to approve. There will be no attempt made to set up this plan in a district where the medical society will oppose it. All we want this House of Delegates to do is to give permission to set up this plan in those districts where the Society by a majority vote will approve. We do not want this organization to try to bind all the doctors or all the societies to any program. We only want to put it into effect in just the districts where it is approved. This is in the By-Laws. We commit ourselves to present it to the societies as a unit."

This statement was followed by a statement by Dr. Woutat: "Two years ago I think the House of Delegates approved in principle the Cass County Plan and gave full permission to the district societies to enter into this plan if they wished to do so. You will note in our report that we recommend that it be adopted on a state-wide basis. To date, no District Society has seen fit to enter into this plan. We feel if the thing is ever going to be put on a state-wide basis, now is the time. Your Board of Directors are certainly not going to direct sales of these policies in a district where the majority of the doctors are opposed to it. Eighty to ninety per cent should be in favor of it and willing to cooperate before a policy would be sold, but no attempt would be made to move into a district where the majority of the doctors would be opposed to this plan. We think, however, it should be put on a state-wide basis."

The question was put and the report of the Reference Committee unanimously adopted.

R. W. RODGERS, M.D., Chairman
W. R. FOX, M.D.
T. Q. BENSON, M.D.

Reference Committee Report on Emergency Medical Service

Dr. A. C. Fortney, Chairman, presented the following report, which was adopted section by section and as a whole: The report of the Committee has been examined and certain recommendations will be made.

At the time of the meeting of the National Committee on Medical Emergency Service in Chicago this was a "hot issue," but certain events such as the April election in Italy and an aroused citizenry in this country have somewhat eased the situation and slowed up certain legislation that would be of direct importance to the medical profession. Therefore, at this time, a definite plan cannot be crystalized. However, in view of possible eventualities, it is recommended that:

1. The Executive Secretary inquire of the Governor of the State of North Dakota as to whether or not he contemplates setting up a Committee on Civilian Defense, and at the same time informing the Governor that the State Medical Society has available a committee that will be ready to serve on his Board to advise in matters pertaining to health and medical care in times of emergency.

2. That the President of the North Dakota State Medical Association appoint such a Committee whenever it seems appropriate.

A. C. FORTNEY, M.D., Chairman
C. C. SMITH, M.D.
V. D. FERGUSSON, M.D.

Reference Committee on Resolutions

Dr. C. J. Glaspel, Chairman, presented the following report which was adopted section by section and as a whole: Your Committee on Resolutions wishes to present the following Resolution:

WHEREAS, the North Dakota State Medical Association has consistently been opposed to the principles of compulsory medical insurance and because such a plan of medical service has always proved less efficient in the care of the sick; and,

WHEREAS, the Wagner-Murray-Dingell Bill which is a form of compulsory medical insurance, is still in committee in our Congress;

NOW, THEREFORE, BE IT RESOLVED, that the North Dakota State Medical Association in regular session in Jamestown, North Dakota, on May 23, 1948, again voice its opposition to the principles of compulsory medical insurance;

BE IT FURTHER RESOLVED, that a copy of this Resolution be forwarded to the Chairman of the Appropriation Committees of the United States Senate and House of Representatives in Washington, D. C.

Your Resolutions Committee wishes to present the following Resolution:

WHEREAS. there exists a definite shortage of nursing personnel in North Dakota, not only in the graduate ranks but also in our nurses training schools;

BE IT THEREFORE RESOLVED that the House of Delegates urge the North Dakota Board of Nurses Examiners or any responsible nursing licensing agency in the State to take whatever steps are necessary to attempt to correct this shortage, in that hospitals in the State may be more efficiently operated and the sick receive better care.

Your Resolutions Committee wishes to present the following Resolution:

WHEREAS Senate Bill 1290 proposes the granting of money by the Federal Government to the various states for the purpose of establishing and developing school health services for the prevention and treatment of physical and mental defects among school children, all of these services to be provided to all school children regardless of the ability of the parents to pay for such services,

NOW, THEREFORE, BE IT RESOLVED that the House of Delegates of the North Dakota State Medical Association oppose such a bill on the grounds that it is impractical and unnecessary.

Your Resolutions Committee wishes to present the following Resolution:

WHEREAS the Woman's Auxiliary of the North Dakota State Medical Association has been organized and developed during the past year under the leadership of its President, Mrs. Annabel K. Arzt,

BE IT RESOLVED that the House of Delegates commend the Auxiliary for their interest and their cooperation in informing themselves relative to medical problems.

Your Resolutions Committee wishes to present the following Resolution:

WHEREAS the Sixty-first Annual Meeting of the North Dakota State Medical Association held in Jamestown, North Dakota, presents an outstanding scientific program plus attractive entertainment,

NOW, THEREFORE, BE IT RESOLVED that the House of Delegates offer its thanks to the Stutsman County Medical Society, to the several local committees, to Doctor Arzt as State President, and to the City of Jamestown for the contributions they have made to insure the success of this meeting.

C. J. GLASPEL, M.D., Chairman
O. A. KNUTSON, M.D.

Unfinished Business

Dr. R. W. Rodgers proposed the following resolution:

WHEREAS, it is entirely within the realm of possibility that the duly elected Speaker of the House of Delegates would be unable to serve in that capacity for various reasons, and

WHEREAS, there has been no provision made in the Constitution and By-Laws of the North Dakota State Medical Association for a presiding officer, in the event the Speaker would be unable to preside at the annual meetings of the House of Delegates, and,

WHEREAS, it would seem advisable that there should be a Vice-Speaker, duly elected by the House of Delegates, in the event the Speaker could not preside, who would have the same duties and privileges as the Speaker.

BE IT THEREFORE RESOLVED that Article 9, Section 1 of the Constitution of the North Dakota State Medical Association be amended to read as follows:

> "The officers of this Association shall be a President, a President-elect, a First Vice-President, a Second Vice-President, a Secretary, a Treasurer, a Speaker of the House of Delegates, a Vice-Speaker of the House of Delegates and ten Councillors."

It was announced by the Speaker that this resolution has to do with a change in the Constitution, and announced that it would be laid on the table for one year and brought up next session, instructing the Secretary to notify each component society three months before the session at which final action must be taken that the Constitution is being amended.

Dr. R. B. Radl placed on behalf of the Sixth District Medical Society, the names of Dr. E. P. Quain and Dr. W. H. Bodenstab for election to honorary membership. Dr. W. H. Gilsdorf likewise proposed the name of Dr. A. W. Macdonald of Valley City to honorary membership. Dr. W. W. Wood, on behalf of the Stutsman District Medical Society likewise placed the name of Dr. W. A. Gerrish before the House to be voted upon for honorary membership. Inasmuch as some question was raised as to whether or not these doctors had actually been licensed in the State of North Dakota for fifty years, a resolution was restated making these doctors available to honorary membership when their period of licensure was verified through the State Board of Medical Examiners. This motion was seconded by Dr. Fergusson and carried.

Dr. A. C. Fortney asked for the privilege of the floor, and made the following statement: "Dr. Nachtwey has given me permission to say a few words. I wish to address the House of Delegates on some matters pertinent in the state. I chose this time because you are all representatives of your societies and you can take this information back to the doctors. This is in regards to the situation of the North Dakota National Guard. The new National Guard has been organized. There are 1500 men going into camp in about two weeks. We have one medical officer and one dentist for this number of men. We can not, at this time, seem to get medical officers for the outfit. We are going to be very handicapped in this respect. Maybe you have young men coming in with you, who have not been in service, that you could probably persuade to come in. This is a problem of the Association and should be our responsibility. These citizens should be taken care of.

Another thing that has happened is that over 50 per cent of these men have not been inoculated for typhoid, paratyphoid, or vaccinated against smallpox. They have approached some of the doctors to have this done and the prices were very high. The state appropriates the funds for these but they do not get appropriations to pay $10.00 or $12.00 to inoculate and vaccinate an individual. I hope you will be kind enough to do this at a minimum fee, or better still, do not make any charge at all, as they do not have funds available to pay the higher fees. The General is very much distressed with this thing and those of us connected with this have been very much concerned about it. Anything you can do to help us with this will be very much appreciated."

To this statement Dr. A. R. Sorenson added: "We have doctors in the state who have been doing this work gratis. I would like to make a motion that it is the sense of this House of Delegates that the work of inoculating and vaccinating the members of the National Guard be done free of charge."

This motion was seconded by Dr. R. B. Radl, and passed.

The Speaker concluded with the inquiry as to whether any new business or resolutions were to be brought before the House, and stated: "If not, your Speaker wishes to congratulate in the highest manner possible the very excellent cooperation he has had from every member of this House. There has been a lot of work completed in record time purely due to the efforts of the Delegates."

Motion was then made by Dr. Sorenson stating: "I would like to make a motion that the House of Delegates by a rising vote, thank the Speaker* for his excellent work at these sessions."

Adjournment

The House of Delegates adjourned *sine die* at 5:30 P.M.

SCIENTIFIC PROGRAM

Monday, May 24, 1948

Jamestown Armory

9:00 to 9:30 A.M.—Registration Time. View exhibits.

9:30 to 9:45—Welcoming Address — The Honorable J. F. Olson, Mayor, City of Jamestown.

9:45 to 10:30—"The Stevens-Johnson Syndrome"—Dr. Erling Hanson, University of Minnesota.

10:30 to 10:45—Intermission. View exhibits.

10:45 to 12:00—"Roentgen Changes in Primary Tuberculosis"—Dr. John Caffey, Cornell University.

Announcements by President Arzt.

2:15 to 3:00 P.M.—"The Use of Female Sex Hormones in Clinical Practice"—Dr. Allan C. Barnes, University of Ohio.

3:00 to 3:30—Intermission. View exhibits.

3:30 to 4:30—"Psychosomatic Medicine in General Practice"—Dr. P. K. Arzt, St. Paul, Minn.

4:30 to 5:30—"Meningitis in Infancy and Childhood"—Dr. L. G. Pray, Fargo Clinic.

Tuesday, May 25, 1948

Jamestown Armory

9:00 to 9:30 A.M.—View exhibits.

9:30 to 10:15—"Diagnosis and Pitfalls in Diagnosis of Poliomyelitis"—Dr. Arthur Abt, National Foundation of Infantile Paralysis.

10:15 to 10:45—Intermission. View exhibitis.

10:45 to 11:30—"Recent Advances in the Diagnosis and Treatment of Thyroid Disease"—Dr. Mavis P. Kelsey, Mayo Clinic.

11:30 to 12:15—"Diagnosis and Treatment of Certain Congenital Cardiac Lesions Amenable to Surgery"—Dr. K. Alvin Merendino, University of Minnesota.

2:00 to 2:30 P.M.—Presidential Address—Dr. P. G. Arzt, Jamestown, N. D.

2:30 to 2:45—Inaugural Address—Dr. W. A. Liebeler, President-elect, Grand Forks, N. D.

2:45 to 3:15—Intermission. View exhibits.

3:15 to 4:15—"Ovarian Neoplasms"—Dr. M. B. Dockerty, Mayo Clinic.

4:15 to 5:00—"Bone Marrow Aspirations"—Drs. C. H. Peters and L. W. Larson, Bismarck, N. D.

Installation of President

Dr. Arzt: Now, we come to a very pleasant feature of the afternoon program, the induction of your new President, Dr. Liebeler. I would like to have Drs. French and Ramstad bring the culprit up to the platform. (Dr. Liebeler escorted to the platform.)

I want to congratulate you. I am very confident of your success. Officers and members of the North Dakota State Medical Association, may I introduce to you your new President, Dr. W. A. Liebeler.

Dr. W. A. Liebeler: Thank you, Mr. President, and thank you very much, Drs. Ramstad and French. I can think of no two better war horses who could have brought me up here and taken the wobbliness out of my knees the way they did.

Surely any individual would be harsh, surely one would be short of sentiment, and surely one would be ungrateful and lacking humility should he not thank those who have been mindful of him and the duties which they have entrusted him with and the confidence they have placed in him by electing him to the office of President of the North Dakota State Medical Association.

I am especially proud of this Society because I have had ample opportunity through work in committees and as a delegate to know that, without exception, all have been diligent and honest in their tasks to make for the fine fellowship and progress that this Society holds at the present time.

Kindly accept now my apologies for errors I will most certainly make in the coming year. But also accept my appreciation for your efforts to advise me in this office and to continue as unselfishly in your efforts, not only to maintain but add and accomplish the aspirations which each member of this State Association hopes for.

Listening to the radio a few evenings ago I heard a young man explaining to a young lady what a prize catch he would be as a husband. And after relating in detail his many attributes and attractions, the young lady retorted that if he actually married for love, most certainly he himself would be the bride. I assure you I will not enumerate my attributes and splendid appearance as I, myself, know I am devoid of them. This I mention because I want you to know that I know it. I am humble at this moment if never before.

I am mindful of this honor and its responsibilities to you and to the public of this great state. This I cannot overlook—when I remember the fine men that have preceded me, and especially Dr. P. G. Arzt, who has just about completed his responsibilities in a most enviable manner.

The pioneers of medicine, surgery, and research who have gone to their rewards and those who still remain and are among us have made for us and are still making a record for us to admire; a record for us to aid in maintaining. We cannot cease or even pause to bask in tranquility and a false pride. These men and women were too busy and earnest in their work; they were too humble; too mindful of the great futures of science to flaunt their measly accomplishments and say even to themselves—this is it—this is the last epoch—this is the cure.

Why then do a few who may momentarily have forgotten our great heritage, cunningly, schemingly, subtly, and only a few, thank goodness, brazenly advertise their officialdom; their keen sense of appreciation and sympathy; their attainments as a very, very distinct specialist, a very select membership in some super selective special speciality in the art of healing? May I suggest that these poor individuals separate their wives from the bondage they endure, separate themselves from our state and national societies and remarry (themselves) and live alone with their stupidity.

May I call to your attention the painstaking work, the time-consuming efforts the various committees of this Association have given without thought of personal aggrandisement or gain.

I am about to mention and pay tribute to a grand war horse, who has been secretary of the State Board of Medical Examiners, long before the memory of many of us in this assembly; has given his wise council and effort in every phase of this society and has doggedly guarded over the past, present, and future of this society; has never lacked in sincerity or willingness to work. He is proud to be a physician and proud enough to call to task those who would detract from his profession. Certainly an example of a true member of this Association. He was a horse-and-buggy physician; he was a Maxwell car physician; and all through the stages of progress of the past fifty years, he has been a part, reluctant to give up the old, the tried, and the established, but willing and anxious to attempt and master the new. I merely mention his name—you have all known of whom I speak ere this—Dr. G. W. Williamson. I speak of Dr. Williamson only because I have known him for many years as a neighbor, a citizen, a physician, and true and enduring friend, exemplary of our great profession.

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*Dr. A. P. Nachtwey, able Speaker of the House of Delegates of the North Dakota State Medical Association, died at his home in Dickinson, North Dakota, June 29, 1948.

Dr. James Grassick, whom all of you knew as a grand champion of medical progress, died at the age, I believe of 92. Only a few weeks before his death we chatted on various subjects. One of these was the threat of state or socialized medicine, and I quote him—"I have been scared and perturbed about socialization of medicine for nigh onto seventy years, and so were the older physicians when I was a boy." It is my opinion that our status will not and cannot be disturbed if we maintain the standards of our great profession as exemplified by those living and gone whom we wholeheartedly admire.

It is apparent we must maintain an organization to keep our legislators informed of our standards and sincerity to obtain the best good to all who are ill, and to guard against those whose voice is sincere but whose motives are questionable. A few in our great profession will always veer from the honorable and acceptable. It is our duty to ourselves and humankind to keep those to the lowest possible minimum and seek to eradicate them entirely. This one aim is not too lofty to be ultimately realized.

Again, may I most sincerely beg of you, the cooperation and good will you, all of you, have given in the past.

Presidential Address

P. G. Arzt, M.D., Jamestown, North Dakota

Mr. Chairman, Members of the North Dakota State Medical Association, Ladies of the Auxiliary, and Visitors:

It is my pleasant duty to welcome all of you to Jamestown and to the Sixty-first Annual Meeting of this Association. I hope that all of you have had both an enjoyable time and have been benefited by the renewal of your acquaintances of your brother physicians throughout the state. This has been a good year for the State of North Dakota. Providence has smiled kindly on our fields and prairies. Grain and cattle have grown in abundance. This is not true, however, in all parts of the world; indeed, parts of our own country have been by no means so fortunate. Throughout the world stirs a feeling of unrest. Group criticizes group and there is a surging pressure for change. Physicians in North Dakota and elsewhere have found themselves the target of criticism and have heard proposals made for the socialization of the practice of medicine.

In many states doctors in their efforts to combat these forces have placed heavy reliance on a new kind of "expert" in the medical field—the specialist in Medical Public Relations. The magic of the title "Public Relations" has brought physicians from all corners of the country to national meetings to listen to "experts" explain how the "public mind" can be moulded—how the "public mind" can be changed. Medical orators declare that "the public must be informed." Publicity men have been hired—large sums of money have been raised—newspaper space has been bought and the presses hum spewing forth literature. In the few moments I have, I would like to debunk the pedestal upon which the concept of public relations has been enthroned the past several years.

In North Dakota I feel that we are very fortunate in not being able to afford one of these new and fancy programs. I feel this way because it seems to me that there is danger in the reliance upon the belief that someone else can make the public like you and that all the doctor has to do is pay the "expert" for dispensing his sugar-coated pills—then sit back and relax. The idea, to me, is dangerous because it is predicated upon a fundamental misconception. The public does not acquire a bad impression of the profession of medicine in any sort of a magical or unexplainable way. It is the individual patient who forms that bad impression of an individual doctor because of the way in which that individual doctor has treated him. The "relations" is an individual matter between the physician and his patient —not a collective matter between a "public mind" and a collective profession.

The Profession doesn't treat The Public, it treats the individual. The Public doesn't have economic relations with the Profession—it's the guy down the street who got the excessive bill. The Profession does not have bad public relations—individuals are simply dissatisfied with what individual doctors did to them, economically, scientifically, or both. How, for example, are doctor-patient relations improved by the employed "relations expert" whose propaganda message is read by Joe Dow who the night before had been told by Doc Smith that he would not come out to see Johnny Dow—a very sick child? Just how vulnerable does the profession become when the Publicity man paints the rosy picture that the physician is pure as the white driven snow and the man sitting on the committee in the legislature knows different because of an unfortunate experience he had just last week?

If the charges made against physicians are true and have a basis in truth, the cure is possible only by treating two parties—the individual physician and his individual patient. This therapy must be largely applied by the physician himself. Each doctor must see to it that his own house is clean. If it is—and most are—you witness the patient who goes time and time again to Old Doc Jones, "the best buy that ever lived."

Because we call upon ourselves to be introspective—to be realistic and make sure that we as physicians carry on our work properly, does not mean that we should not carry on a vigorous campaign against those who by fanning an existent dissatisfaction would foist upon the public a system of medical care which we *know* would not be in the public interest. We must continue to attack the Wagners, the Murrays, the Dingells, the Altmeyers and the Falks, and also the smaller Altmeyers and Falks who use the prestige of their office and federal monies unlawfully to attempt to create pressure on Congress for their proposals. We must be ever vigilant that the socialization of medicine, with its attendant bureaucracy to end all bureaucracies, shall not be accomplished piecemeal by first including all infants through the age of 21 and pregnant mothers and all youths of school age. Both these methods and others have been and are being tried in the halls of Federal Congress.

It is readily admitted by all health authorities that medical care is but one factor in the accomplishment of community health. High or higher on the list is proper nutrition, high standards of environment (including both the physical environment of the family home and the moral environment of proper parental, church and educational guidance). Because a portion of the public cannot afford or do not know what constitutes a good nutritional diet or because they cannot afford a fine small home, or because some parents, churches or educational institutions fail to provide an adequate moral guidance, will these same proponents of socialized medicine advocate and pay for a uniform diet or a uniform home? Will they set a compulsory standard for parents and churches to follow? Will they take over the financial obligation of public schools and dictate the curriculum? It is not too far-fetched to presume that is exactly what they have in mind. They admit that these other factors are of equal importance in community health.

One may then well conclude that they simply desire the socialization of medicine for the vast bureaucratic power which would result, or that they do intend and are working toward the complete socialization of our economy. Neither result is desired by the American public. Yes, we should try to warn all Americans that history has ample proof that compulsory health insurance is the keystone of the Socialistic State and has been from the time of Bismarck's Germany to the time of Atley's England. And it is not name calling to call the public's attention to the fact that socialized medicine is also the keystone of communism. It is, of course, foolish to claim that all who back federal medicine are one or the other. It is not foolish, however, to point out the common background.

But again, just as we must always strive to keep our own relations with our patients on a basis above reproach, we must never meet national or state social needs on a negative basis. The American Way has never been a static thing and must never become so. Improvements must be sought and accomplished in these larger fields. If these improvements are to be patterned in the American Way, they must be meshed into the doctrine which gives primacy to the dignity of the individual and not into a doctrine which holds the individual subservient to an all-powerful state. We have within us the power, the opportunity of demonstrating to the public the American Way of easing the burden of the cost of medical care.

Sunday the governing body of this organization voted to expand a physician-sponsored program of voluntary prepayment medical care insurance. It will begin as a program to cover only catastrophic sickness and will remain so until experience shows the road toward complete coverage for all human ailments. It is, nevertheless, one of the unique programs of the nation. In it the doctor binds himself to charge no more than the amount specified in the fee schedule—the patient is assured that no further charge will be made. It is a program which no person, group or business concern could offer but the physician himself. It is a program that will be offered in good faith to all North Dakotans and a program which will require genuine cooperation between the physicians and those who wish to budget against the cost of catastrophic illness. Let it be understood, however, that this plan will not be a cure-all for all problems of community health. In the first place, it will not cover illnesses which normally are less costly in nature. The reason for this at the inception of this program is simple. To include all illness would require a substantially higher premium. In addition, without actuarial experience in North Dakota it would be hazardous to attempt to establish an actuarially correct rate. The former would have the effect of building purchaser resistance in a new field—the latter would be unsound business. Further, as indicated before, the plan is not a cure-all, as it encompasses only one of several factors which go toward the improvement of community health. The plan will make it possible for all who voluntarily care to join to protect themselves absolutely against the normally high cost of illnesses.

This forward step and others toward an ever-increasing standard of health can be accomplished through the voluntary cooperation of all persons genuinely interested in improved health. The medical profession will extend its hand wherever it can be of aid. It has done so innumerable times in the past through cooperation with various state departments having health problems. It has done so with the Veterans Administration so that the veteran might have the best medical care available in the state. It will not, however, extend its hand to grasp a compulsory system of federal medicine — a scheme common to all collective ideologies — and a scheme which has resulted in the deterioration of the standard of medical care in every country where it has been tried.

And now it is time for the new regime to take over. You know, it is a fine thing that we have a new set of officers each year — some organizations have the same ones year in and year out. In some ways that may be efficiency, but for my money I'll take the more democratic system. But before I lose my final chance, let me express my deepest appreciation to every member of this Association. As shown by the reports in the Handbook for the House of Delegates, the committees carried on their work with thoughtfulness and persuasion. The Council and the State Officers have pulled their share, and the House of Delegates has acted most judiciously. The local societies have shown a rebirth in growth and activity, and the doctors of North Dakota have taken one more step on the road of progress.

SECOND ANNUAL MEETING
WOMAN'S AUXILIARY TO THE NORTH DAKOTA STATE MEDICAL ASSOCIATION
Jamestown, North Dakota, May 24-25, 1948

The Second Annual Meeting of the Woman's Auxiliary to the North Dakota State Medical Association convened Monday morning, May 24, 1948, in the parlors of the Presbyterian Church, Jamestown, North Dakota.

The meeting was called to order by the State President, Mrs. P. G. Arzt, who gave a short address of welcome.

The Pledge of Loyalty was given by Mrs. W. F. Baillie, President-Elect, and repeated in unison by the members present.

Roll call of officers, state committe chairmen, councillors and presidents of district auxiliaries was then taken.

Minutes of the First Annual Meeting and the Fall Board Meeting were read and approved, with the addition of the name of Mrs. F. W. Fergusson, President of the Eighth District Auxiliary, present at the Fall Board Meeting, and the appointment of Mrs. Allen K. Johnson, Williston, Councillor of the Kotana District.

Mrs. C. V. Bateman of Wahpeton reported that they had met and organized on May 17th, with ten members present. This is the Richland County Auxiliary of the First District.

Mrs. Borland, Treasurer, reported a paid-up membership of 163 and a balance of cash on hand of $122.25. Her report was, on motion, accepted.

Mrs. Arzt suggested that a sum be given the President for her expenses to the National Convention, and Board Meeting, and Mrs. Schaefer explained the method used in Kansas. Decision was deferred, to give the members time to consider it.

The report of the President, Mrs. P. G. Arzt, was then given. This was as printed in the annual report. Mrs. Arzt added that since her report was written, the Grand Forks District had organized, with 52 members.

Mrs. Leo J. Schaefer, national officer, of Salina, Kansas, the state officers, committee chairmen, councillors and presidents of district societies were introduced.

Mrs. Schaefer then gave a short talk, and also discussed the Organization Map prepared for display by Mrs. Arzt, showing the entire state organized with the exception of the Kotana District.

At this time, Dr. Joseph Sorkness of Jamestown, member of the Advisory Council, was introduced and spoke to the group on Socialized Medicine, asking the Auxiliary members to acquaint themselves with that plan and be prepared to explain what it would mean to the public.

Dr. P. G. Arzt, president of the North Dakota State Medical Association, was introduced and spoke briefly, bringing greetings to the group from his organization.

The Constitution and By-Laws were read and discussed.

Chapter V—Dues—Section 1 of the By-Laws, was revised to read—"Dues required by said Woman's Auxiliary to the American Medical Association."

Chapter V—Dues—Section 11, was revised to read—"dues amounting to $2.00 for the State, plus the dues required by National, as per Section 1."

Motion made by Mrs. R. W. Rodgers, and seconded by Mrs. A. P. Nachtwey, that the Constitution and By-Laws as read and revised, be adopted. Motion carried.

Meeting adjourned to reconvene at 2:00 P.M.

* * *

Called to order by the President, Mrs. Arzt, who appointed the nominating committee as follows: Mrs. V. D. Fergusson, Edgeley; Mrs. J. F. Hanna, Fargo; Mrs. R. W. Rodgers, Dickinson; and Mrs. O. A. Knutson, Buxton.

The report of the President-Elect, Mrs. Baillie, followed. This, and the reports of Mrs. Gilsdorf and Mrs. Devine, Jr., Councillors of the Fourth and Fifth Districts, and those of Mrs. C. W. Robertson, President of the Seventh District; Mrs. F. L. Wicks, President of the Fifth District; Mrs. F. W. Fergusson, Eighth District; Mrs. Graham, Second District; and Mrs. H. A. Wheeler, Sixth District, were given, as prepared and printed in the annual report.

Mrs. Arzt spoke on the question of electing delegates to the National Convention. She read a portion of the social program for the convention to be held in Chicago. Motion was made by Mrs. Wicks, Valley City, and seconded by Mrs. Ramstad of Bismarck, that Mrs. H. M. Berg be elected delegate. Carried. Motion made by Mrs. Baillie, Fargo, and seconded by Mrs. Rodgers, Dickinson, that Mrs. Moore of Grand Forks be elected second delegate. Carried.

On motion of Mrs. Borland, Fargo, and seconded by Mrs. Devine, Jr., Minot, Mrs. Toomey, of Devils Lake was elected alternate.

The report of the Nominating Committee was then heard, as follows:

President—Mrs. W. F. Baillie, Fargo.
President-Elect—Mrs. H. M. Berg, Bismarck.
First Vice President—Mrs. Ted Keller, Rugby.
Second Vice President—Mrs. Joseph Devine, Jr., Minot.
Recording Secretary—Mrs. O. M. Smith, Killdeer.
Treasurer—Mrs. V. G. Borland, Fargo.
Councillors, for three year term:
  Fifth District—Mrs. W. H. Gilsdorf, Valley City
  Fourth District—Mrs. A. D. McCannel, Minot.
  Ninth District—Mrs. P. A. Boyum, Harvey.

There being no nominations from the floor, these officers were declared elected.

A questionnaire received from the Post War Planning Committee, National Chairman, was read by Mrs. Arzt, and the information required was supplied or completed by the various members present.

Mrs. Schaefer explained that there would be a probable new publication decided upon at National this year, possibly to supplant the Bulletin now received. If so, this would be paid for by the new National dues.

No bills were presented.

A general discussion period followed:

It was decided that election of officers in District Auxiliaries should be held at the last meeting in the spring, before the State Convention, and new officers take over with the fall meetings.

That guests be limited to those only who would be eligible to join, or visiting members.

That titles of District Auxiliaries coincide with the District Medical Society title.

That the fiscal year dates for the District Auxiliaries be uniform and that they conform to the By-Laws already adopted, beginning and ending with the State Convention; and that dues be sent in to the State Treasurer before March 1 of each year.

Mr. E. F. Engebretson, Executive Secretary of the North Dakota State Medical Association was introduced by Mrs. Arzt, who extended to him the appreciation of the Auxiliary for his valuable assistance to us during our initial year.

Mrs. Arzt then introduced Dr. Sedlak of Fargo, member of the Advisory Council, who in turn introduced Mr. Frank E. Smith, Director, Associated Medical Care Plans, Chicago. Mr. Smith gave a very instructive talk on the Blue Shield Plan of Medical Care and urged especially that this group consider during the coming year, the following three points:

That we learn about the current status of public opinion and thinking on Socialized Medicine;

That we become familiar with the alternate system of Voluntary Prepayment Medical Plans, and the present example of that system as set up in Fargo;

That we schedule ourselves to get this information out to all local groups through their program chairmen, and that we help sell the public on the Blue Shield Plan which the State Medical Association has just now adopted. A definite proposal on this is now to be worked out and presented to the public on a statewide basis.

After closing remarks by Mrs. Arzt, the meeting adjourned. Next Annual Convention to be held in Minot.

* * * *

The Annual Auxiliary Banquet was held at the Crippled Children's Home, followed by a short address by Mrs. Leo J. Schaefer. Mrs. Baillie, newly elected President, then proposed a rising vote of thanks to Mrs. Arzt for her untiring efforts during the organization year of the Auxiliary.

A movie on Child Psychology followed with a supplementary talk and explanation by Dr. L. G. Pray of Fargo.

Preceding the Convention meetings, a delightful tea was enjoyed at the home of Mrs. B. H. Kroeze, on Sunday afternoon, May 23.

Tuesday Morning, May 25

Meeting called to order by Mrs. Arzt.

A motion was made by Mrs. Ramstad of Bismarck and seconded by Mrs. Berg of Bismarck, that $25.00 be given the State President to use toward her expenses. Carried.

Installation of the following officers for the ensuing year followed:

Mrs. W. H. Baillie, Fargo, President
Mrs. H. M. Berg, Bismarck, President-Elect
Mrs. Ted Keller, Rugby, First Vice President
Mrs. Joseph Devine, Jr., Minot, Second Vice President.

Mrs. Arzt, retiring President, then relinquished the chair, and Mrs. Baillie presided at the post-convention board meeting.

Present were Mrs. H. M. Berg, President-Elect; Mrs. Ted Keller, First Vice President; Mrs. Joseph Devine, Jr., Second Vice President; Mrs. O. M. Smith, Recording Secretary; Mrs. R. D. Weible, Councillor, First District; Mrs. V. D. Fergusson, Councillor, Eighth District; Mrs. E. J. Larson, Councillor, Seventh District; Mrs. N. O. Ramstad, State Historian; Mrs. F. W. Fergusson, Mrs. J. N. Elsworth, Mrs. C. W. Robertson, Mrs. G. S. Carpenter.

State committee appointments were made as follows: Historian—Mrs. N. O. Ramstad, Bismarck; Organization—Mrs. H. M. Berg, Bismarck, Mrs. Ted Keller, Rugby, and Mrs. Joseph Devine, Jr., Minot, assisting; Bulletin—Mrs. F. O. Woodward, Jamestown; Program—Mrs. H. Paul Johnson, Minot; Revisions Committee—Mrs. John C. Fawcett, Devils Lake; Nominations—Mrs. P. G. Arzt, Jamestown, Chairman; Post War Planning—Mrs. A. A. Kjelland, Hatton.

Mrs. Baillie asked Mrs. Cable, Hillsboro; Mrs. A. D. McCannel, Minot; Mrs. H. A. Wheeler, Mandan; and Mrs. R. D. Weible, Fargo, to choose someone from each of their districts to assist Mrs. Arzt on the Nomination Committee for the next annual convention.

Motion was made by Mrs. Ramstad and seconded by Mrs. Berg that a note of thanks and appreciation be written the State Medical Association for their assistance during the year. Carried.

Mrs. Baillie announced Fall Board Meeting dates: September 29-30, in Fargo.

No bills were presented for the current session.

Mrs. Baillie asked each Councillor to check and see that each District Auxiliary has prepared and adopted a Constitution and By-Laws.

She urged that subscriptions to, and use of, the Hygeia Magazine be encouraged by every District Auxiliary. It was suggested that one or two copies be supplied by local Auxiliaries for rural schools in their territory.

Local Auxiliaries were asked to work for 100 per cent membership and to send lists of new officers and also membership lists to Mrs. Baillie, making sure of correct names and street addresses if any.

A motion was made by Mrs. Devine and seconded by Mrs. Keller that a Year Book, containing list of state officers, national officers, councillors, district officers and members, with addresses, be compiled. Carried.

Mrs. Baillie offered to procure copies of the Handbook to be sent to each officer, councillor and district president.

It was announced that Mrs. Baillie would be attending the national convention in Chicago, and motion was made and carried that she be uninstructed and free to vote according to her judgment. An invitation will be extended to the national president, Mrs. Kice, to attend our next annual convention.

Mrs. Baillie gave each officer a short outline of her duties and responsibilities, and asked each to keep an account of her expenses, to be presented at the next annual meeting.

District auxiliary officers were asked to contact their medical advisor before adopting any program or project activity.

A membership drive was suggested for the first meeting in the fall.

Mrs. Baillie asked that publicity on meetings and programs be sent to her, and also given to the local press, and advised that speakers from the American Medical Association may be secured for special programs.

Mrs. Weible, Councillor First District, reported having had a letter on the need for and advantages of the nursing profession, sent to each graduating class to be read to the girls.

It was suggested that local Auxiliaries cooperate with the County Nurse and assist in collecting used clothing for distribution to needy families.

That an essay contest on Socialized Medicine be sponsored in the schools with material and awards supplied.

That Public Health units be assisted with surveys or other projects they may be presenting.

The meeting adjourned and was followed by a delightful luncheon at the Jamestown Country Club. Mr. E. F. Engebretson was the interesting and instructive speaker.

1948 MEMBERSHIP ROSTER

WOMAN'S AUXILIARY TO THE NORTH DAKOTA STATE MEDICAL ASSOCIATION

(Membership by Districts)

CASS COUNTY

President: Mrs. S. C. Bacheller	Enderlin
Secretary: Mrs. C. M. Hunter	Fargo
Treasurer: Mrs. E. M. Haugrud	Fargo

Bacheller, Mrs. S. C.	Enderlin
Baillie, Mrs. W. F.	719 Broadway, Fargo
Bond, Mrs. J. H.	921 South 9th St., Fargo
Borland, Mrs. V. G.	1514 South 9th St., Fargo
Corbus, Mrs. B. C., Jr.	426 - 14th Ave. S., Fargo
Darner, Mrs. C. B.	1121 North 5th St., Fargo
DeCesare, Mrs. F. A.	1401 South 9th St., Fargo
Dillard, Mrs. J. R.	620 South 8th St., Fargo
Elofson, Mrs. C. E.	1334 North 3rd St., Fargo
Fjelde, Mrs. J. H.	1526 South 8th St., Fargo
Fortney, Mrs. A. C.	1122 South 9th St., Fargo
Foster, Mrs. G. C.	1513 South 8th St., Fargo
Gronvold, Mrs. F. O.	910 Broadway, Fargo
Hanna, Mrs. J. F.	907 - 12th Ave. S., Fargo
Haugrud, Mrs. E. M.	1310 North 3rd St., Fargo
Hawn, Mrs. H. W.	1224 North 4th St., Fargo
Heilman, Mrs. C. O.	1338 North 2nd St., Fargo
Hewes, Mrs. F. L.	604 South 3rd St., Fargo
Hunter, Mrs. C. M.	1335 South 6th St., Fargo
Huntley, Mrs. H. B.	Kindred
Joistad, Mrs. A. H.	1201 South 8th St., Fargo
Klein, Mrs. A. L.	1441 South 9th St., Fargo
Lancaster, Mrs. W. E. G.	1437 South 8th St., Fargo
Larson, Mrs. G. A.	1538 South 9th St., Fargo
Lewis, Mrs. T. H.	121 North 5th St., Fargo
Mazur, Mrs. B. A.	1237 North 3rd St., Fargo
Moe, Mrs. Allan E.	1112 Sixth Ave. S., Moorhead, Minn.
Nichols, Mrs. W. C.	1449 South 10th St., Fargo
Ostfield, Mrs. J. H.	1120 - 5th Avenue S., Fargo
Poindexter, Mrs. M. H.	721 South 4th, Moorhead, Minn.
Pray, Mrs. L. G.	1526 South Seventh St., Fargo
Richter, Mrs. E. H.	Hunter
Rodgers, Mrs. R. G.	1217 South Seventh St., Fargo
Sedlak, Mrs. O. A.	1406 South 8th St., Fargo
Stafne, Mrs. W. A.	1409 South 9th St., Fargo
Swanson, Mrs. J. C.	1220 South 8th St., Fargo
Urenn, Mrs. B. M.	1005 South 9th St., Fargo
Weible, Mrs. R. D.	1630 South 9th St., Fargo

DEVILS LAKE

President: Mrs. J. D. Graham	Devils Lake
Secretary-Treasurer: Mrs. J. C. Fawcett	Devils Lake

Engesather, Mrs. J. A. D.	Brocket
Fawcett, Mrs. D. W.	1105 Fifth St., Devils Lake
Fawcett, Mrs. J. C.	1125 Fifth St., Devils Lake
Gerber, Mrs. L. S.	Lakota
Graham, Mrs. J. D.	510 Tenth Ave., Devils Lake
Hughes, Mrs. B. J.	Rolla
Keller, Mrs. E. T.	Rugby
Mahoney, Mrs. J. H.	915 Eighth St., Devils Lake
Palmer, Mrs. D. W.	Cando
Sihler, Mrs. W. F.	412 Seventh St., Devils Lake
Toomey, Mrs. G. W.	418 Seventh St., Devils Lake

GRAND FORKS

President: Mrs. G. G. Thorgrimson	Grand Forks
Secretary: Mrs. E. A. Canterbury	Grand Forks
Treasurer: Mrs. Joseph J. Stratte	Grand Forks

Alger, Mrs. L. J.	81 Fourth Ave. S., Grand Forks
Benson, Mrs. T. Q.	1101 Reeves Drive, Grand Forks
Benwell, Mrs. H. D.	625 South Third St., Grand Forks
Canterbury, Mrs. E. A.	209 Conklin, Grand Forks
Culmer, Mrs. A. E., Jr.	316 Cambridge, Grand Forks
Gislason, Mrs. G. J.	801 Belmont Road, Grand Forks
Graham, Mrs. C. M.	822 Belmont Road, Grand Forks
Grinnell, Mrs. E. L.	111 Eighth Ave. S., Grand Forks
Gunderson, Mrs. R. L.	1709 Lewis Blvd., Grand Forks
Haunz, Mrs. E. A.	109 Fourth Ave. S., Grand Forks
Jensen, Mrs. A. F.	1119 Cottonwood, Grand Forks
Liebeler, Mrs. W. A.	619 Belmont Road, Grand Forks
Lohrbauer, Mrs. L. T.	1019 Reeves Drive, Grand Forks
Mahowald, Mrs. R. E.	606 Fifth St., Grand Forks
Quale, Mrs. V. S.	1620 Belmont Road, Grand Forks
Ruud, Mrs. H. O.	1118 Reeves Drive, Grand Forks
Silverman, Mrs. Louis	606 Reeves Drive, Grand Forks
Stratte, Mrs. Joseph J.	403 Division Ave., Grand Forks
Thorgrimson, Mrs. G. G.	1215 Lincoln Drive, Grand Forks
Williamson, Mrs. G. M.	526 Belmont Road, Grand Forks
Witherstine, Mrs. W. H.	214 Eighth Ave. S., Grand Forks
Youngs, Mrs. N. A.	511 Reeves Ave., Grand Forks

KOTANA

Skjelset, Mrs. A. G., member-at-large	Watford City

NORTHWEST

President: Mrs. F. R. Erenfeld	Minot
Secretary: Mrs. Wm. J. Ball	Minot
Treasurer: Mrs. D. J. Halliday	Kenmare

Ball, Mrs. Wm. J.	405 Thompson Apts., Minot
Breslich, Mrs. P. J.	814 Fourth St. S.E., Minot
Cameron, Mrs. A. L.	318 Eighth Ave. S.E., Minot
Combs, Mrs. A. B.	920 Third Ave. N.E., Minot
Devine, Mrs. J. L., Jr.	901 Fourth St. S.E., Minot
Dyson, Mrs. R. E.	717 Fourth St. S.E., Minot
Erenfeld, Mrs. H. M.	306 Ninth St. S.E.,Minot
Erenfeld, Mrs. F. R.	616 Lincoln Ave., Minot
Fischer, Mrs. V. J.	707 Third St. S.E., Minot
Gammell, Mrs. R. T.	Kenmare
Halliday, Mrs. D. J.	Kenmare
Haraldson, Mrs. Olaf	918 Second Ave. S.E., Minot
Halverson, Mrs. H. L.	912 Second St. N.W., Minot
Ingals, Mrs. C. L.	434 Fifth Ave. N.W., Minot
Johnson, Mrs. H. P.	108 Ninth Ave. S.E., Minot
Kermott, Mrs. Henry	21 Seventh St. N.W., Minot
Lampert, Mrs. M. T.	101 Tenth St. N.W., Minot
Lyman, Mrs.	M.S.T.C., Minot
McCannel, Mrs. A. D.	505 Main, Minot
O'Neill, Mrs. R. T.	529 Third St. S.E., Minot
Peabody, Mrs. C. S.	202 Thomas Apts., Minot
Pence, Mrs. J. R.	St. 4, Emerson Apts., Minot
Seiffert, Mrs. G. S.	Rural, Minot
Spomer, Mrs. J. P.	115 Seventh St. S.E., Minot
Sorenson, Mrs. A. R.	114 Sixth St. S.E., Minot
Uthus, Mrs. Oliver	17 W. Cent. Ave., Minot
Woodhull, Mrs. R. B.	915 Fourth St. S.E., Minot

RICHLAND

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Kellogg, Mrs. I. W.	Fairmount
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Sasse, Mrs. Sophia	Lidgerwood
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Merrett, Mrs. J. P.	Valley City
Meredith, Mrs. C. J.	Valley City
Macdonald, Mrs. A. C.	Valley City
Macdonald, Mrs. A. W.	Valley City
Wicks, Mrs. F. L.	Valley City
Brown, Mrs. Nida	Valley City
Crosby, Mrs. Kate	Valley City

SIXTH

President: Mrs. H. A. Wheeler	Mandan
Secretary: Mrs. L. W. Larson	Bismarck
Treasurer: Mrs. E. G. Vinje	Hazen

Arneson, Mrs. C. A.	714 Second St., Bismarck
Baumgartner, Mrs. C. J.	615 Washington, Bismarck
Bahamonde, Mrs. J. M.	Elgin
Berg, Mrs. H. M.	214 Avenue A, Bismarck
Brandes, Mrs. Marion E.	601 Fifth Ave., Bismarck
Boerth, Mrs. E. H.	610 Avenue B, Bismarck
Breslin, Mrs. R. H.	107 First Ave. N.W., Mandan
Buckingham, Mrs. T. W.	1030 Fifth Ave., Bismarck
Cartwright, Mrs. J. T.	926 Seventh Ave., Bismarck
Cochrane, Mrs. R. B.	520 Ave. C West, Bismarck
DeMoully, Mrs. O. M.	Flasher
Fredricks, Mrs. L. H.	112 Ave. B West, Bismarck
Freise, Mrs. P. W.	831 Mandan, Bismarck
Heffron, Mrs. M. M.	317 Avenue D, Bismarck
Hetzler, Mrs. A. E.	602 Sixth Ave. N.W.,. Mandan
Icenogle, Mrs. G. D.	232 Ave. C West, Bismarck
Larson, Mrs. L. W.	219 Ave. B West, Bismarck
Orr, Mrs. A. C.	922 Ninth Ave., Bismarck
Owens, Mrs. P. L.	622 Second, Bismarck
Nickerson, Mrs. Evelyn	309 Fifth Ave. N.W., Mandan
Peters, Mrs. Clifford	220 Ave. A West, Bismarck
Pierce, Mrs. W. B.	615 Raymond, Bismarck
Radl, Mrs. R. B.	422 Ave. B West, Bismarck
Ramstad, Mrs. N. O.	824 Fourth, Bismarck
Salomone, Mrs. E.	Elgin
Spielman, Mrs. George	309 First Ave. N.W., Mandan
Thompson, Mrs. Arnold	1124 Fourth, Bismarck
Vinje, Mrs. E. G.	Hazen
Waldschmidt, Mrs. R. H.	600 Washington, Bismarck
Wheeler, Mrs. H. A.	100 Fourth St. N.E., Mandan

SOUTHERN

President: Mrs. F. W. Fergusson	Kulm
Secretary-Treasurer: Mrs. B. W. Maloney	LaMoure

Fergusson, Mrs. V. D.	Edgeley
Fergusson, Mrs. F. W.	Kulm
Maloney, Mrs. B. W.	LaMoure
Meunier, Mrs. H. J.	Oakes

Van Houten, Mrs. R. W.	Oakes
Wolfe, Mrs. F. E.	Oakes

SOUTHWESTERN

President: Mrs. A. J. Gumper	Dickinson
Secretary-Treasurer: Mrs. H. L. Reichert	Dickinson

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Dukart, Mrs. Ralph	229 W. Sixth St., Dickinson
Guloien, Mrs. H. E.	41 Fifth Ave. W., Dickinson
Gumper, Mrs. A. J.	128 Sims St., Dickinson
Nachtwey, Mrs. A. P.	115 Fifth Ave. W., Dickinson
Reichert, Mrs. H. L.	543 First Ave. W., Dickinson
Rodgers, Mrs. R. W.	146 W. Sixth St., Dickinson
Schumacher, Mrs. W.	Hettinger
Smith, Mrs. O. M.	Killdeer
Spear, Mrs. A. E.	610 First Ave. W., Dickinson

STUTSMAN

President: Mrs. C. W. Robertson	Jamestown
Secretary-Treasurer: Mrs. R. D. Nierling	Jamestown

Arzt, Mrs. P. G.	502 Fourth Ave. S.E., Jamestown
Carpenter, Mrs. G. S.	State Hospital, Jamestown
Cuthbert, Mrs. W. H.	State Hospital, Jamestown
DePuy, Mrs. J. L.	721 Second Ave. N.W., Jamestown
DePuy, Mrs. T. L.	301 Second Ave. S.E., Jamestown
Elsworth, Mrs. J. N.	420 Fourth Ave. N.E., Jamestown
Gerrish, Mrs. W. A.	606 Fourth Ave. S.E., Jamestown
Jansonius, Mrs. John	405 Fourth Ave. S.E., Jamestown
Larson, Mrs. E. J.	321 Second Ave. S.E., Jamestown
Nierling, Mrs. R. D.	511 Third St. S.E., Jamestown
Pederson, Mrs. Thomas	316 Fourth Ave. N.E., Jamestown
Robertson, Mrs. C. W.	106 Sixth St. N.W., Jamestown
Sorkness, Mrs. Joseph	318 Third Ave. S.E., Jamestown
Wager, Mrs. Wm. D.	404 Second Ave. S.E., Jamestown
Wood, Mrs. W. W.	509 Second Ave. N.E., Jamestown
Woodward, Mrs. F. O.	722 Third St. N.E., Jamestown

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Secretary-Treasurer: Mrs. O. A. Knutson	Buxton

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Kjelland, Mrs. A. A.	Hatton
Knutson, Mrs. O. A.	Buxton
LaFleur, Mrs. H. A.	Mayville
Little, Mrs. R. C.	Mayville
Vinje, Mrs. Syver	Hillsboro

TRI-COUNTY

President: Mrs. P. A. Boyum	Harvey
Secretary: Mrs. E. J. Schwinghamer	New Rockford
Treasurer: Mrs. C. G. Owens	New Rockford

Boyum, Mrs. P. A.	Harvey
Ford, Mrs. F. W.	New Rockford
Gilliland, Mrs. R. F.	Carrington
Owens, Mrs. C. G.	New Rockford
Schwinghamer, Mrs. E. J.	New Rockford
Voglewede, Mrs. Wm.	Carrington

North Dakota State Medical Association Roster - 1948

MEMBERSHIP BY DISTRICTS

Cass County Medical Society

Urenn, B. M., President	Fargo
Bond, J. H., Secretary	Fargo

Bacheller, S. C.	Enderlin
Baillie, W. F.	Fargo
Baird, J. A.	Fargo
Bakke, Hans	Lisbon
Bond, J. H.	Fargo
Borland, V. G.	Fargo
Burt, A. C.	Fargo
Burton, P. H.	Fargo
Clark, I. D., Jr.	Casselton
Darner, C. B.	Fargo
Darrow, F. I. (retired)	Fargo
Darrow, K. E.	Fargo
DeCesare, F. A.	Fargo
Dillard, J. R.	Fargo
Dodds, G. A.	Fargo
Elofson, C. E.	Fargo
Fjelde, J. H.	Fargo
Fortin, H. J.	Fargo
Fortney, A. C.	Fargo
Foster, G. C.	Fargo
Gronvold, F. O.	Fargo
Hanna, J. F.	Fargo
Haugrud, E. M.	Fargo

Cass County—(Continued)

Hawn, H. W.	Fargo
Heilman, C. O.	Fargo
Hendrickson, G.	Enderlin
Hunter, G. W.	Fargo
Huntley, H. B.	Kindred
Ivers, G. U.	Fargo
Joistad, A. H.	Fargo
Klein, A. L.	Fargo
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Larson, G. A.	Fargo
Lewis, T. H.	Fargo
Long, W. H.	Fargo
Mazur, B. A.	Fargo
Miller, H. W.	Casselton
Morris, A. C.	Fargo
Nichols, A. A.	Fargo
Nichols, W. C.	Fargo
Oftedal, Trygve	Fargo
Ostfield, J. R.	Fargo
Pray, L. G.	Fargo
Richter, E. H.	Hunter
Sand, Olaf	Fargo
Sedlak, O. A.	Fargo
Stafne, W. A.	Fargo
Swanson, J. C.	Fargo
Tainter, Rolfe	Fargo
Tronnes, Nels	Fargo

Cass County—(Continued)

Urenn, B. M.	Fargo
Weible, R. D.	Fargo

Devils Lake Medical Society

Keller, E. T., President	Rugby
Fawcett, D. W., Secretary	Devils Lake

Engesather, J. A. D.	Brocket
Fawcett, D. W.	Devils Lake
Fawcett, J. C.	Devils Lake
Fox, W. R.	Rugby
Gerber, L. S.	Lakota
Graham, J. D.	Devils Lake
Horsman, A. T. (Honorary)	Devils Lake
Hughes, B. J.	Rolla
Johnson, C. G.	Rugby
Jones, E. A.	Devils Lake
Keller, E. T.	Rugby
McCrae, S. C.	Rolla
MacDonald, J. A.	Cando
Mahoney, J. H.	Devils Lake
Palmer, D. W.	Cando
Stickelberger, J. S. (Retired)	Oberon
Toomey, G. W.	Devils Lake
Vigeland, G. N.	Maddock

Grand Forks Medical Society

Thorgrimson, G. G., Pres.	Grand Forks
Silverman, Louis, Sec.	Grand Forks

Alger, L. J.	Grand Forks
Benson, T. Q.	Grand Forks
Benwell, H. D.	Grand Forks
Brown, B. E.	Grand Forks
Brown, G. F.	Grand Forks
Burrows, F. N. (Honorary)	Bathgate
Campbell, R. D.	Grand Forks
Canterbury, E. A.	Grand Forks
Caveny, K. P.	Langdon
Countryman, G. L.	Grafton
Countryman, J. E. (Honorary)	Arch Cape, Ore.
Culmer, A. E., Jr.	Grand Forks
Dailey, Walter C.	Grand Forks
Deason, F. W.	Grafton
Field, A. B. (Honorary)	Forest River
Flaten, A. N.	Edinburg
French, H. E.	Grand Forks
Fritzell, K. E.	Grand Forks
Glaspel, C. J.	Grafton
Goehl, R. O.	Grand Forks
Graham, C. M.	Grand Forks
Grinnell, E. L.	Grand Forks
Gunderson, R. L.	Grand Forks
Hardy, N. A.	Minto
Haugen, C. O.	Larimore
Haunz, E. A.	Grand Forks
Hubler, W. L.	Grand Forks
Jensen, A. F.	Grand Forks
Johann, O. P.	Grafton
Lamont, J. G.	Grafton
Landry, L. H.	Walhalla
Lawton, A. H.	Grand Forks
Leigh, R. E.	Grand Forks
Liebeler, W. A.	Grand Forks
Lohrbauer, L. T.	Grand Forks
Lommen, C. E.	Fordville
Mahowald, R. E.	Grand Forks
Moore, J. H.	Grand Forks
Mulligan, V. A.	Langdon
Muus, J. M.	McVille
Muus, O. H.	Grand Forks
Panek, A. F.	Milton
Peake, F. Margaret	Grand Forks
Ouale, V. S.	Grand Forks
Rand, C. C.	Grafton
Ruud, H. O.	Grand Forks
Ruud, M. B.	Grand Forks
Saiki, A. K. (Associate)	Grand Forks
Sandmeyer, J. A.	Grand Forks
Silverman, Louis	Grand Forks
St. Clair, R. T.	Northwood
Stratte, J. J.	Grand Forks
Strom, A. D.	Langdon
Thorgrimson, G. G.	Grand Forks
Tompkins, C. R.	Grafton
Vance, R. W.	Grand Forks
Waldren, G. R.	Cavalier
Waldren, H. M.	Drayton
Weed, F. E.	Park River
Williamson, G. M.	Grand Forks
Witherstine, W. H.	Grand Forks
Woutat, P. H.	Grand Forks
Youngs, N. A.	Grand Forks

Kotana Medical Society

AbPlanalp, I. S., Pres.	Williston
Skjelset, A. G., Sec.	Watford City

AbPlanalp, I. S.	Williston
Craven, J. D.	Williston
Craven, J. P.	Williston

Kotana—(Continued)

Hagan, E. J.	Williston
Johnson, A. K.	Williston
Johnson, P. O. C.	Watford City
Jones, C. S.	Williston
Korwin, J. J.	Williston
Lund, C. M.	Williston
McPhail, C. O.	Crosby
Skjelset, A. G.	Watford City
Wright, W. A.	Williston

Northwest District Medical Society

McCannel, Malcolm, Pres.	Minot
Kermott, Henry, Sec.	Minot

Ayash, J. J.	Minot
Ball, Wm. J.	Minot
Beck, Charles	Harvey
Blatherwick, Robert	Parshall
Blatherwick, W. E.	Sanish
Bethea, R. O., Jr.	Minot
Breslich, P. J.	Minot
Cameron, A. L.	Minot
Combs, A. B.	Minot
Conroy, M. P.	Minot
Craise, O. S.	Towner
Devine, J. L., Sr.	Minot
Devine, J. L., Jr.	Minot
Dyson, R. E.	Minot
Erenfeld, F. R.	Minot
Fischer, V. J.	Minot
Flath, M. G.	Stanley
Gammell, R. T.	Kenmare
Garrison, M. W.	Minot
Goodman, Robert	Powers Lake
Halliday, D. J.	Kenmare
Halverson, C. H.	Minot
Halverson, H. L.	Minot
Hammargren, A. F.	Harvey
Hanson, G. C.	Minot
Hill, Lloyd	Bottineau
Ingals, C. L.	Minot
Johnson, H. P.	Minot
Johnson, I. A.	Bottineau
Johnson, O. W.	Rugby
Kaufmann, M. I. H.	Kent, Eng.
Kermott, Henry	Minot
Kermott, L. H	Minot
Kernwein, G. A.	Minot
Knudson, K. O.	Glenburn
Lampert, M. T.	Minot
Livingston, N. B.	Mohall
McCannel, A. D.	Minot
McCannel, Malcolm	Minot
McGauvran, T. E.	Minot
Malvey, Kenneth	Bottineau
Nelson, L. F.	Robbinsdale, Minn.
Nelson, Woodrow	Salt Lake City, U.
Neve, H. E.	Rolette
Peabody, C. S.	Minot
Ransom, E. M.	Minot
Rowe, P. H.	Minot
Seiffert, G. S.	Minot
Sorenson, A. R.	Minot
Sorenson, Rodger	Minot
Spomer, J. P.	Minot
Timm, J. F. (Honorary)	Makoti
Uthus, Oliver S.	Minot
Wall, W. W.	Minot
Wallbank, W. L.	San Haven
Wheelon, F. E.	Minot
Woodhull, R. B.	Minot

Richland County Medical Society

Bateman, C. V., Sec.	Wahpeton

Bateman, C. V.	Wahpeton

Richland County—(Continued)

Beithon, E. J.	Wahpeton
Beltz, Melvin E.	Wahpeton
Irvine, V. S.	Lidgerwood
Miller, H. H.	Wahpeton
Schleinitz, F. B.	Hankinson
Thompson, A. M.	Wahpeton
Wasemiller, E. R.	Wahpeton
Witters, E. G.	Milnor

Sheyenne Valley Medical Society

Merrett, J. P., Pres.	Valley City
Meredith, C. J., Sec.	Valley City

Almklov, L.	Cooperstown
Christianson, Gunder	Valley City
Cook, P. T.	Valley City
Gilsdorf, W. H.	Valley City
Macdonald, A. C.	Valley City
Macdonald, A. W.	Valley City
Meredith, C. J.	Valley City
Merrett, J. P.	Valley City
Van Houten, J.	Valley City
Westley, K. F.	Cooperstown
Wicks, F. L.	Valley City

Sixth District Medical Society

Wheeler, H. A., Pres.	Mandan
Arneson, C. A., Sec.	Bismarck

Arneson, C. A.	Bismarck
Baer, DeWitt	Steele
Bahamonde, J. B.	Elgin
Baumgartner, C. J.	Bismarck
Benson, O. T.	Hollywood, Calif.
Berg, H. M.	Bismarck
Bertheau, H. J.	Linton
Bixby, Harriet	Bismarck
Bodenstab, W. H.	Bismarck
Boerth, E. H.	Bismarck
Brandt, A. M. (Retired)	Bismarck
Breslin, R. H.	Mandan
Brink, N. O.	Bismarck
Buckingham, T. W.	Bismarck
Cartwright, John	Bismarck
Cochran, R. B.	Bismarck
Constans, G. M.	Bismarck
DeMoully, O. M.	Flasher
Diven, W. L.	Bismarck
Driver, Donn R.	Fargo
Fredricks, L. H.	Bismarck
Freise, P. W.	Bismarck
Gaebe, O. C.	New Salem
Griebenow, F. F.	Bismarck
Grorud, A. C.	Bismarck
Heffron, M. M.	Bismarck
Heinzeroth, George	Turtle Lake
Henderson, R. W.	Bismarck
Hetzler, A. E.	Mandan
Hill, F. J.	Minneapolis, Minn.
Icenogle, G. D.	Bismarck
Jacobson, M. S.	Elgin
LaRose, V. J.	Bismarck
Larson, L. W.	Bismarck
Lipp, G. R.	Bismarck
Monteith, George	Hazelton
Moyer, L. B.	Lake Preston, S. D.
Nuessle, R. F.	Bismarck
Orr, A. C.	Bismarck
Owens, P. L.	Bismarck
Perrin, E. D.	Bismarck
Peters, Clifford	Bismarck
Pierce, W. B.	Bismarck
Quain, E. P. (Retired)	Eugene, Ore.
Quain, F. D. (Retired)	Bismarck
Radl, R. B.	Bismarck
Ramstad, N. O.	Bismarck
Roan, M. W. (Retired)	Bismarck
Rosenberger, H. P.	Bismarck

Sixth District—(Continued)

Salomone, E.	Elgin
Saxvik, R. O.	Bismarck
Schoregge, C. W.	Bismarck
Smith, C. C.	Mandan
Soules, Mary	Billings, Mont.
Spielman, George	Mandan
Thompson, Arnold	Bismarck
Vinje, E. G.	Hazen
Vinje, R. X.	Beulah
Vonnegut, F. F.	Linton
Waldschmidt, R. H.	Bismarck
Weyrens, P. J.	Hebron
Wheeler, H. A.	Mandan

Southern District Medical Society

Wolfe, F. E., Pres.	Oakes
Meunier, H. J., Sec.	Oakes
Fergusson, F. W.	Kulm
Fergusson, V. D.	Edgeley
Lynde, Roy	Ellendale
Maloney, B. W.	LaMoure
Meunier, H. J.	Oakes
Miller, Samuel	Minneapolis, Minn.
Van Houten, R. W.	Oakes
Wolfe, F. E.	Oakes

Southwestern District Medical Society

Hill, S. W., Pres.	Regent
Reichert, H. L., Sec.	Dickinson

Southwestern District—(Continued)

Dach, J. L.	Hettinger
Dukart, C. R.	Richardton
Dukart, Ralph	Dickinson
Gilsdorf, A. R.	Dickinson
Guloien, H. E.	Dickinson
Gumper, A. J.	Dickinson
Hill, S. W.	Regent
Maercklein, O. C.	Mott
Murray, K. M.	Scranton
Olesky, E.	Mott
Reichert, H. L.	Dickinson
Rodgers, R. W.	Dickinson
Schumacher, N. W.	Hettinger
Schumacher, W. A.	Hettinger
Smith, O. M.	Killdeer
Spear, A. E.	Dickinson
Vogl, Charles	Bowman

Stutsman County Medical Society

DePuy, J. L., Pres.	Jamestown
Nierling, R. D., Sec.	Jamestown
Arzt, P. G.	Jamestown
Carpenter, G. S.	Jamestown
Culbert, M. H.	Medina
Cuthbert, W. H.	Jamestown
DePuy, J. L.	Jamestown
Elsworth, J. N.	Jamestown
Fisher, A. M.	Jamestown
Gerrish, W. A.	Jamestown
Holt, G. H.	Jamestown
Jansonius, J. W.	Jamestown
Larson, E. J.	Jamestown

Stutsman County—(Continued)

Nierling, R. D.	Jamestown
Pederson, T. D.	Jamestown
Sorkness, Joseph	Jamestown
Stokes, G. P.	Streeter
Wood, W. W.	Jamestown
Woodward, F. O.	Jamestown
Woodward, Robert S.	Jamestown

Traill-Steele Medical Society

Cable, T. M., Pres.	Hillsboro
Vinje, Syver, Sec.	Hillsboro
Cable, Thomas M.	Hillsboro
Cleary, H. G.	Sharon
Dekker, O. D.	Finley
Kjelland, A. A.	Hatton
Knutson, O. A.	Buxton
LaFleur, H. A.	Mayville
Little, R. C.	Mayville
Savre, M. T.	Northwood
Vinje, Syver	Hillsboro

Tri-County Medical Society

Gilliland, R. F., Pres.	Carrington
Voglewede, W. C., Sec.	Carrington
Boyum, P. A.	Harvey
Gilliland, R. F.	Carrington
Matthaei, D. W.	Fessenden
Owens, C. G.	New Rockford
Schwinghamer, E. J.	New Rockford
Seibel, L. J.	Harvey
Voglewede, W. C.	Carrington

Roster, North Dakota State Medical Association - 1948

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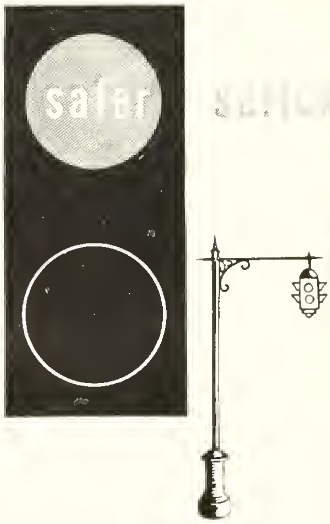

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The JOURNAL LANCET

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Volume LXVIII, No. 10
New Series

The Diagnosis and Pitfalls in the Diagnosis of Poliomyelitis

Arthur F. Abt, M.D.*
Chicago, Illinois

Acute anterior poliomyelitis is an infectious and communicable virus disease affecting the central nervous system, and as is generally not recognized, infrequently results in paralysis. By this broad definition probably many more cases of this disease are unrecognized than are diagnosed.

In discussing the diagnosis of this condition, therefore, one can only indicate aids in diagnosis, such as points gleaned from the history, the symptoms and signs, and the laboratory examinations.

Poliomyelitis is not a new disease. It was probably known to the Egyptians as early as 1600 B.C. The first adequate description of the disease was by Underwood in 1784. Heine, a German orthopedist, established the disease as a clinical entity and Medin (1887) noted its epidemic character. In Europe the disease is called Heine-Medin disease after these original observers.

Although poliomyelitis can be an extremely crippling disease, as manifested by those unfortunate enough to be afflicted by the extreme paralytic type, the outcome, as has been already noted, results in much less frequent paralysis than is generally held.

Incidence, Epidemiology and Transmission

The disease occurs most commonly in epidemic form during certain seasons of the year. Sporadic cases may occur at any time during the year, and one should never rule out the possibility of its occurrence in attempting a diagnosis because the case is seen in an off season. In my experience one of the most severely paralyzed cases, which survived, occurred in early March in Illinois.

The disease is widespread in the United States.[2] The epidemic season is usually ushered in in April, May or June on the West Coast and in the Southwest. The epidemic occurrence then seems to move eastward. Sporadic cases occur in the Midwest in July; August and September are the peak months for this disease in the Midwest and East.

The disease occurs throughout the world, and outside the United States epidemics have been reported most frequently from the Scandinavian countries, western Europe, England and Australia. In World War II our troops in the Philippines, Japan and North China suffered a considerable incidence of this disease.

As far as age incidence is concerned, the disease affects infants, children, young adults and is uncommon over the age of forty.

H. M. Dehn [3] has recently reported the age incidence of poliomyelitis in Cleveland for the years 1930, 1941, 1944 and 1946. It will be noted that in 1930 the greatest number of cases occurred between 0 to 4 years. In 1946 by far the greatest number of cases occurred in the 5 to 9 year old group. Thus, it seems that within 16 years the age incidence has shifted to an older group of children.

Males are said to be more frequently affected than females, in a ratio of 3 to 2. In some epidemics the

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Read before the annual meeting of the North Dakota State Medical Association, May, 25, 1948.

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colored race has been less afflicted than the white race; in other epidemics this tendency has been reversed.

Some investigators have emphasized the effects of exercise, chilling, trauma, economic status, body type, endocrine factors and dietary deficiencies as predisposing factors. The specific effects of these factors need more investigation and proof.

Pregnancy seems to definitely enhance susceptibility to this disease. Tonsillectomy or operations about the nose and throat have been heralded as liable to predispose to the occurrence of poliomyelitis during the epidemic period. In 20 years I have never seen a case of poliomyelitis develop following tonsillectomy during June, July, August or September in Chicago, and I have seen many tonsils removed during that period.

The fact that the disease occurs in epidemics in certain seasons of the year, particularly the warmer months, raises the question of transmission and modes of spread. Much time, effort, and research, not only of an epidemiologic nature but also of an experimental nature, has produced a great deal of conflicting information on the part of many observers. For many years a group of experimentalists held that the olfactory route was the one way that infection occurred in man, drawing their conclusion by inference from the monkey. The work of Toomey in Cleveland pointed out finally, after bitter struggle, that the intestinal tract could very well be a portal of entry. The disease is probably spread by human contact—perhaps by way of the intestinal tract, perhaps by way of the nose and throat—either by direct contact or by way of contaminated foods and materials.

It is said there are four possible points of elimination of the virus from the body: from the bowel, mouth or nose, the urinary tract, and the blood (which assumes the aid of a biting insect.)

Gebhardt and McKay [4] note that the bites of insects, such as flies and mosquitos, suggest a possible means of virus spread. According to Robert Ward,[5] recent attempts to reduce the fly population by spraying DDT did not yield conclusive results in reducing the incidence of poliomyelitis, although the spraying did cut down the number of flies in the area sprayed, as compared to a control area.

Gebhardt and McKay have recently traced the relationship of poliomyelitis epidemics to the fruit harvest. They have shown that in 206 cases surveyed by them, fresh, unwashed or unpeeled fruits and vegetables were eaten preceding the attack of the disease.

Water supplies, milk supplies, and swimming pools have been incriminated, most highly by some and less so by others. In the epidemic in Idaho in 1947, which I was privileged to witness at first hand, it did seem that the incidence of cases followed the irrigating ditches, which were not without sewage contamination, and in which the children were wont to enjoy their swimming.

Finally, most recently over-civilization and modern plumbing have been blamed. If this mode of reasoning were followed, there would probably by a great revival in the industry for which Chic Sales was the unparalleled huckster.

CLINICAL TYPES OF THE DISEASE

Poliomyelitis is a disease which manifests itself clinically by its protean nature. You will recall that in offering a definition at the beginning of this paper I stated that the disease infrequently results in paralysis. This brings us to the three broad clinical types of the disease: *abortive, non-paralytic* and *paralytic poliomyelitis.* All three of these types infer a systemic invasion of the individual by the specific virus of poliomyelitis.

ABORTIVE POLIOMYELITIS

Clinically, this type is undiagnosable because of the lack of particulate signs and symptoms. A given infant, child or person who has been exposed or has been in contact with a known case in an epidemic may be suspected of having systemic infection. Clinically, the diagnosis can not be proved nor disproved from the vague symptoms and lack of signs which exist during this time. Examination of the spinal fluid at this stage of the illness is normal. An early exact diagnostic test is urgently necessary to enable us to diagnose abortive poliomyelitis with any degree of accuracy.

NON-PARALYTIC POLIOMYELITIS

Such a case with definite history of exposure or contact in an epidemic will have not only characteristic symptoms but also clinical signs and spinal fluid changes. Such cases are termed non-paralytic if no weakness or paralysis develops.

PARALYTIC POLIOMYELITIS

When weakness or paralysis follows the systemic infection the case is termed a paralytic type. This type may be further subdivided according to paralysis and nerve tissue involved into: (1) spinal; (2) spinal bulbar; (3) bulbar; (4) meningitic; (5) encephalitic; (6) ataxic.

SYMPTOMS

Dromedary type. Following the systemic invasion, certain symptoms may occur which cause an illness in the individual for from one to three days. Thereafter, the patient seemingly recovers and is again taken ill with the development of weakness or paralysis. This syndrome was named by Draper, the "dromedary" type or group, because the symptoms appeared in two successive "humps".[6] The first stage has been referred to as the prodromal stage, or first hump, which is the nonspecific febrile illness. After an interval of 4 to 7 days during which the patient is symptom-free, the invasion of the central nervous system, which has been termed the second hump, occurs.

General Symptoms. Usually the onset of symptoms is abrupt and the initial symptoms are regarded by some as caused by a general invasion of the virus rather than by a direct irritation of the various parts of the nervous system. The incubation period is probably never less than 6, or more than 18 days.

Some authors divide the symptomatology into three divisions—the systemic, central nervous system and paralytic phases. In the systemic phase the onset is usually acute and similar to the beginning of any acute illness. Fever, headache, anorexia, nausea and occasionally vomiting occur chiefly during this phase and no definite diagnosis can be made—only a presumptive diagnosis—particularly during an epidemic in the prevalent season of the year, and from a history of possible exposure. If the symptoms subside in from 24 to 36 hours, and the patient remains well thereafter, we have probably witnessed a typical case of abortive poliomyelitis; probably a high percent (some state as high as 80 per cent) of infected individuals have this type of abortive poliomyelitis and no more.

If the attending physician uses all his clinical acumen, he is sorely beset during the poliomyelitis season in his region to make a mental diagnosis of abortive poliomyelitis on every patient seen with one or all of these four or five symptoms. If he informed the family of every such patient that his diagnosis was acute poliomyelitis, he would probably be asked for further proof which he could not furnish, and the same would be true if he reported such cases to the local public health authorities. Spinal fluid examination in this early systemic state would be entirely normal.

It is self-evident that the greatest medical need in regard to this disease is a rapid, accurate diagnostic test in this early stage which would confirm the clinical suspicions, for it is quite probable that only in this first early phase would any therapeutic agent ever prove effective.

As stated, the great majority of infected individuals never reach the second phase which involves the central nervous system. Most often the first phase is so slight that it is overlooked. When the first phase is recognized and the symptomless period intervenes before the resumption of symptoms, we have the dromedary type, the occurrenec of which has already been described.

In the second phase of involvement of the central nervous system we may add to the general symptoms of fever, headache, anorexia, nausea and vomiting, the complaints of stiffness of the neck and stiffness of the back. In a recent review of 225 cases, A. L. Hoyne[7] has enumerated the following principal symptoms of his patients:

Principal Complaints of 225 Poliomyelitis Patients

Fever	218
Stiffness of neck	172
Headache	150
Stiffness of back	130
Anorexia	101
Vomiting	95
Nausea	68
Sore throat	54
Listlessness	46
Urinary retention	34

In this second phase the patient usually appears more ill than his temperature and clinical findings indicate. Headache is the most often complained of pain, though the patient may also complain of pain or stiffness in the neck, back, abdomen or extremities. Increased sweating is often a prominent symptom, and occasionally in some epidemics stupor may exist during this phase. At this stage a lumbar puncture will show definite characteristic changes in the spinal fluid, and if weakness or paralysis does not develop and recovery ensues, we have witnessed the course of a non-paralytic poliomyelitis.

The third or paralytic phase, as the name implies, is the easiest to recognize; paresis or paralysis in varying degree accompanies the symptoms that have gone before.

SIGNS

According to Josephine Neal,[8] one of the earliest signs is hypersensitiveness, which occasionally is so marked that the slightest stroking over any part of the skin may be irritating to the patient. However, it is more common and may be demonstrated by somewhat deeper pressure along the spine and over the large nerve trunks. Occasionally tremors and twitchings of groups of muscles are noted. One of the most important signs is stiffness of the neck or back. This sign was first described by Caverly in 1894, and is also known as the ventral flexion sign. According to Hoyne, with the patient still in the supine position the head is bent forward while the examiner prevents elevation of the shoulders by placing his right hand on the patient's chest. If the patient is able to sit up, he may be asked to draw up his knees and touch them with his forehead. If he says he cannot accomplish this simple feat and you ask him why, the customary answer is, "It hurts my back."

In 1916 Hoyne[9] described an important sign known as the "head drop." He described this sign as follows[7]: "With the patient lying supine on a flat table, the body is raised slowly by lifting the shoulders and the head will drag on the table, or else the head is raised with difficulty but cannot be maintained for long in a plane with the body. Ordinarily the normal person when raised in this manner will either maintain the head in the plane with the trunk or flex the head on the chest."

Early in the disease the reflexes are usually exaggerated and equal. Luckily, the laity is ignorant of this sign; it has often been my experience upon examining a child at home who elicits hyperactive reflexes, for the parents to give an audible sigh of relief while inwardly I usually have had the gravest misgivings. As the disease progresses, the deep reflexes become unequal and are diminished or lost. The superficial reflexes usually are unaffected. Occasionally the abdominal reflex may be sluggish or lost on one side, and some believe this may indicate impending paralysis on that side.

If paralysis occurs, and it is always flaccid, it usually develops on the second or third day of this phase of the disease. Pain, diminution or loss of the deep reflexes and weakness or twitching of muscle groups may be premonitory signs of approaching paralysis. During different epidemics there is a great difference in the distribution and severity of paralysis, and the degree of involvement will vary from slight weakness to complete loss of power. Muscle pain is rarely complained of and there is usually little or no tenderness of the muscles.

Following paralysis, manipulation may produce pain by stretching the nonparalyzed muscles. This is the muscle spasm to which Sister Kenny has called attention.

The height of the fever and its duration will depend on the severity of the attack, and until the temperature has returned to normal, and remains so for 48 hours, one must assume that the infective process may still be active and that further paralysis may occur. Thereafter, the acute phase may be said to be terminated, and no further paralysis or damage need be expected. Occasionally there may be some difficulty in voiding, and in the severely paralyzed case there may be retention of urine, necessitating catheterization, or there may be incontinence.

The two signs which I regard as most indicative for making the diagnosis are the spinal sign and the head-drop. If both these signs are absent, a positive diagnosis will probably not be made. If one or both are present, with characteristic spinal fluid findings, a positive diagnosis should be relatively easy.

In some epidemics the disease has been accompanied by pronounced respiratory signs; concomitant coryza, sore throat, bronchitis and conjunctivitis have confused the diagnosis at the onset.

Constipation is said to be the rule in poliomyelitis, though in some epidemics diarrhea has been reported.

LABORATORY AIDS IN DIAGNOSIS

The blood and urine show no characteristic changes. The spinal fluid is a great diagnostic aid. The cell count is nearly always more than 10 and usually lymphocytes predominate. The count may range to several hundred. In some instances polymorphonuclears may predominate. Protein is slightly to moderately increased and sugar is normal. Culture of the spinal fluid is sterile. (Fig. 1).

FIG. 1
Spinal Fluid

Disease	Pressure	Appearance	Cells	Globulin	Sugar
Normal	70–200 mm.	Clear, Colorless	1–15 mono.	0	40–75 mgm./100 cc.
Acute Poliomyelitis	± Normal	Clear, Colorless	25–500 P.M.N. Early	+	Normal
Tuberculous Meningitis	500–1000 mm.	Clear, Colorless and Film	25–500 usually mono.	++ to +++	15–20 mgm./100 cc.
Acute Purulent	500–1000 mm.	Turbid	Up to 6000 P.M.N.	00	10 mgm./100 cc.
Encephalitis	200 or more	Clear, Colorless	20–200	± Lead ++++	Normal

PARALYSIS

In the spinal type of the disease any group of muscles or single muscle may be involved. While the leg and arm muscles are most commonly afflicted, one should not forget that the abdominal, intercostal, diaphragm, neck and even facial muscles may be involved.

BULBAR

In the bulbar type of poliomyelitis one or more of the cranial nerves are involved. Thus, such signs as strabismus, lid-lag, facial paralysis, palatal or pharyngeal paralysis or paralysis of the tongue may occur. Usually a nasal twang to the voice, hoarseness, increased accumulation of mucus in the nasopharynx and difficulty in swallowing are the initial symptoms of bulbar paralysis. Severe bulbar involvement resulting in damage to vital centers causes such signs as irregularities in pulse, respiration, hyperthermia, drop in blood pressure, shock, pulmonary edema and cardiac arrest (vagal).

MENINGITIC AND ENCEPHALITIC TYPES

Infrequently, meningitic poliomyelitis occurs as a special type. Here the virus apparently affects chiefly the leptomeninges. Occasionally the brain is involved to the exclusion of the lower motor neurons, and this has been termed the encephalitic type of poliomyelitis. Likewise, an ataxic type has infrequently been described. Medin noted transitory ataxia during convalescence, with muscular spasms and tremors during the acute stage of the disease. There was no atrophy of the muscles and the ataxia was transitory.

DIFFERENTIAL DIAGNOSIS

From the definition already given of abortive poliomyelitis, the clinical diagnosis is impossible, because in this systemic phase of the disease a single symptom or combination of any symptoms may be the forerunners of any acute infection. There is no involvement of the central nervous system at this stage of the disease and therefore a lumbar puncture will reveal a normal spinal fluid.

In the second type, namely, nonparalytic poliomyelitis, there has been not only a systemic invasion but also involvement of the central nervous system. Such cases may be diagnosed when they occur during a season of the year in which polliomyelitis is known to be prevalent and particularly during epidemic periods. Spinal fluid changes are characteristic of poliomyelitis and though no paresis or paralysis develops, a diagnosis of nonparalytic poliomyelitis can be made with some assurance.

Such cases were common in Chicago and throughout Illinois during the summer and fall of the 1947 season. According to J. L. Sievers [10] of the Illinois Department of Public Health, headache, stiff neck and stiff back were almost invariably present and increased cell counts were found in the spinal fluid. In contrast to the usual picture of poliomyelitis, most of the 1947 cases did not progress beyond this state. Furthermore, many cases showed various encephalitic signs of some degree.

As an example, a 6½ year old girl from a small community in Illinois was seen by me on September 15, 1947. The noteworthy findings were: (1) the fact elicited from the history that the child had had a severe headache and fever seven days previously; (2) that poliomyelitis was epidemic; (3) that the headache continued intermittently; and (4) that the spinal fluid showed a pleocytosis with a lymphocytic predominance. The child continued afebrile with the complaint of headache persisting. One week later another spinal puncture revealed 67 white blood cells per cubic milliliter, of which 64 were lymphocytes and 3 were polymorphonuclears. The reflexes, which on the first examination had been brisk, were considerably diminished, particularly the knee jerks which could only be elicited upon reinforcement. A careful check of all muscle groups by a physiotherapist revealed no weakness. The child was re-examined two months later following the original illness, and there had been no complaints of headache in the interim, and all reflexes were again active and equal.

This child exhibited during a period when poliomyelitis was epidemic one of the cardinal symptoms, headache. She had diminished reflexes, she had a clear spinal fluid with increased cell count. At no time did she show a paresis or paralysis of any muscle or muscle group.

If this case were diagnosed as a non-paralytic case of poliomyelitis, the diagnosis would have to rest on the following facts: (1) occurrence of the sickness during an epidemic period; (2) from the only presenting symptoms, headache with fever at onset; (3) moderate diminution of deep and superficial reflexes; (4) pleocytosis in the spinal fluid.

According to William C. Gibson [11] of Montreal, the differential diagnoses to be considered are legion. The obvious are tuberculous meningitis, encephalitis, epidemic cerebrospinal meningitis and meningitis due to other organisms. Everyone who has been involved in an acute epidemic will have seen a miscellaneous group of illnesses pronounced poliomyelitis. Top [12] in an analysis of 843 cases referred to the hospital between 1927 and 1936 with a presumptive diagnosis of poliomyelitis notes that 56 per cent actually turned out to be poliomyelitis. Of the other 44 per cent, various types of the meningitedes constituted over 5 per cent, rheumatic fever 2½ per cent, epidemic encephalitis nearly 1 per cent, pneumonia over 2½ per cent; there were also a number of gastrointestinal upsets and diseases, including dysentery and typhoid fever.

Also, conditions such as pain or swelling of an extremity are not typical of poliomyelitis, nor is cervical lymphadenitis, causing stiffness of the neck.

All spastic paralyses should be easily ruled out, as should the various peripheral types of neuritis. In an epidemic, occasional cases of hysteria occur and these will often be troublesome until completely investigated.

The following quotation from Josephine Neal [8] is illuminating: "A differential diagnosis between the encephalitic or ataxic type of poliomyelitis and epidemic encephalitis can be made with no degree of assurance. It may also be stated that it is often difficult or impossible to differentiate the nonparalytic type of poliomyelitis from the meningeal type of encephalitis—or clinically from lymphocytic chorio-meningitis. Another disease from which poliomyelitis must be differentiated is variously termed as polyneuritis, neuronitis, or the Guillain-Barré syndrome. Undoubtedly this is occasionally diagnosed as poliomyelitis. This disease is characterized by a rather gradual onset, often with pain and sometimes with sensory disturbances. Flaccid paralysis develops which may be very extensive but which usually clears up satisfactorily. The sensory disturbance usually is not marked. Guillain claims that a diagnostic sign is idiomuscular contractibility and also the spinal fluid picture." In the few cases of this disease that Neal has seen, the diagnosis has been made on the fact that the protein in the spinal fluid increased after the acute stage had been passed and remained at a high level for a long time. The two etiological factors which have been suggested are: (1) a virus (2) a vitamin deficiency, probably of B_1.

Post-infectious types of encephalitis, particularly those associated with the acute contagious diseases occurring after measles, mumps and vaccination, should be differentiated by the history of a preceding contagion. Similarly, flaccid paralysis from transverse myelitis following contagious disease should be diagnosed by the history.

Organic diseases of the brain, such as brain tumor and brain abscess, should not be too confusing if careful neurologic and ophthalmologic examinations have been made. Heavy metal poisoning, such as lead and arsenic, can be differentiated by the local nature of the paralyses, as wrist and ankle drop, and the encephalitic types by other accompanying signs of the poisoning.

Levinson [13] notes that in differentiating meningitis from poliomyelitis, the cerebrospinal fluid is clear and colorless, the pleocytosis not so great as in meningitis, the glucose of the cerebrospinal fluid is not reduced and, the lactic acid content is not increased as in meningitis.

Relapses or Recurrences

According to Ruhräh,[14] a relapse may occur after the child has been paralyzed. This occurs with a recrudescence of fever after the temperature has been normal, often with an extension of paralysis. This may occur from two weeks to two months after the initial attack.

Second Attacks of Poliomyelitis

While these are comparatively rare, they are not unknown in the literature. After a lapse of a number of years, a second attack of poliomyelitis may occur. Batten [15] has reported the occurrence of second attacks.

Ruhräh notes that two such cases occurred in the New York epidemic of 1916. Neal has seen six cases and Fischer and Stillerman [16] have collected records of 19, and added one of their own from the New York City epidemic of 1935.

Bridge [17] reported six cases from Buffalo during the summer of 1944. Alves and Pugh [18] report a case which occurred in a 12 year old girl in England in 1947. The first attack had occurred in 1938 when she was 3½ years old. They note that 37 cases of second attacks of poliomyelitis have been reported in the American literature.

As an explanation of the occurrence of second attacks in humans, it has been suggested that infection with another strain of virus other than that which caused the first attack may be responsible.

Prevention

There are no known sera or vaccines as yet available for the prevention of this disease. For a time, nasal sprays of various chemicals were used but these procedures have been discontinued. From the material already presented, only such general advice can be given as: (1) avoidance of strenuous exercise during an epidemic; (2) avoidance of crowds to obviate contact infection; (3) avoidance of raw, unpeeled fruits and vegetables during epidemic periods; (4) screening and control of flies; (5) adequate sewage disposal; and (6) the closing of swimming beaches and pools known to be contaminated by sewage. It is preferable that the removal of tonsils or operations on the nose and throat should not be performed during the epidemic poliomyelitis season. Unfortunately, it often happens that a child contracts poliomyelitis even though well protected in all known ways.

Summary

Poliomyelitis is more widespread throughout the world than has been generally held. The age incidence of the disease seems to be changing. The greatest number of cases has shifted within 15 years from the 0 to 4 years to the 5 to 9 year old group.

The mode of spread, once held to be only by contact, now includes the possibility of spread by insects, such as flies contaminating food or by biting insects. Ingestion of fresh unwashed, unpeeled fruits, and vegetables has been given a prominent place in the spread of the disease, and most lately, civilization and modern plumbing has assumed a prominent etiologic role in some recent reports.

It has been pointed out that neither a clinical nor a laboratory diagnosis can be made for the abortive type of poliomyelitis as this is a systemic stage of the infection without involvement of the central nervous system. Nonparalytic poliomyelitis may be diagnosed from history, symptoms, clinical signs and spinal fluid findings, even though no paresis or paralysis develops. The principal symptoms and chief signs have been fully discussed, as well as the available laboratory findings. The most indicative signs for diagnosis are the spine sign (ventral flexion) and the head-drop.

Differential diagnosis with illustrative examples have been presented.

Relapses or recurrences and second attacks of poliomyelitis have been reviewed and prevention has been discussed.

Conclusion

Only a rapid method for virus identification could positively indicate whether many of the cases seen in Illinois this fall were actually due to the poliomyelitis virus or to such other known viruses as that of St. Louis encephalitis, equine encephalomyelitis, a different strain of poliomyelitis, or to a new and unknown virus.

Until such time as we obtain a rapid method for virus culture, all the clinical acumen and knowledge at our disposal will only allow us to make a presumptive and not a positive diagnosis of such cases.

This is in agreement with a recent publication of Hart Van Riper,[19] Medical Director for the National Foundation for Infantile Paralysis, who includes under his statement of major problems to be solved for poliomyelitis:

1. The development of a simple laboratory test to identify, preferably, a single virus particle.

2. Development of a simple diagnostic laboratory test to indicate whether or not infection with the virus has taken place.

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Abdominoperineal Proctosigmoidectomy: Its Complications and Sequelae

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The purpose of this discussion is to consider the complications and sequelae peculiarly inherent in the "pull through" or "over and under" type of operation more commonly designated as "abdominoperineal proctosigmoidectomy, without colostomy and with preservation of the sphincter musculature."

Initially, it may be well to define our approach to the surgical management of lower bowel malignancy under the following headings, inasmuch as the application of proctosigmoidectomy is so frequently misunderstood.

A. Cancerous growths involving the upper two thirds of the sigmoid are extirpated by: (1) an exteriorization procedure, such as the Mikulicz-Rankin maneuver, or (2) by immediate establishment of intestinal continuity either by a closed end-to-end anastomosis (using Wangensteen, Furniss-Clute or Stone clamps), or by the open technic, and with or without complemental enterostomy.

B. Those involving the lower third of the sigmoid, the rectosigmoid and the ampullary portion of the rectum (lower 3 cm. of the rectum excluded), are removed by the abdominoperineal technic of proctosigmoidectomy without colostomy and with preservation of the internal and external sphincter muscles.

C. Those involving the anal canal and lowest 3 cm. of the rectum are excised by the abdominoperineal technic of Miles with the establishment of an abdominal colostomy.

In an intimate consideration of such a procedure, it should be pointed out that our experience is based on a personal series of 391 proctosigmoidectomies of which 361 have been for cancer. The mortality from resection is 4.3 per cent and 4.7 per cent, respectively. It may be mentioned in addition that our figures show a five year cure of 52.6 per cent and a local recurrence rate of 17.9 per cent. It might also be brought to attention that the rate of resectability for our entire group of patients has been maintained over the seven year period slightly in excess of 80 per cent. This figure is based on the number of patients examined and found to have carcinoma, and not on the number submitted to operation. In the latter instance, the resectability rate would be 88.8 per cent.

The complications to be discussed under this heading may also occur following the Miles operation, i. e., prolapse of the sigmoidal mucosa, sloughing due to inadequate blood supply, abscess formation, etc. A comparison of the difficulties in technic between the proctosigmoidectomy and the Miles procedure will show that the abdominal phase of the proctosigmoidectomy is simpler, quicker and more easily executed than the same phase in the Miles procedure except that adequate arterial arcades must be meticulously preserved in the "pull through" maneuver. On the other hand, the perineal phase of the proctosigmoidectomy is much more tedious than the similar phase in the Miles method. It is more time-consuming and may be extremely difficult if the initial perianal incision is inaccurately made, or where the bowel is torn, and particularly when deep pelvic mobilization has not been accomplished during the abdominal dissection. These difficulties are faults of the operator and not of the operation.

The occasional occurrence of incontinence with embarrassing episodes of soiling and dribbling, together with contracture and retracture due either to lack of viability or infection has been previously reported.[1] In order to avoid these distressing complications and sequelae we must first consider the relevant and basic factors as to their cause.

Sloughing of the transplanted bowel. Surely the most serious but happily the least common complication is the sloughing of the terminal portion of the "pulled-through-bowel." This is due, of course, to either a misjudgment in the selection of the limit of transection of the mesocolon, or to gross infection interfering with the blood supply. It is immediately apparent that meticulously careful palpation and visualization (with transillumination) of the arterial pattern is imperative in order to select the optimum location for division between the vessels to be preserved and those to be sacrificed. The blood supply has been adequately discussed by Smith and the authors.[2] Complete mobilization of the pelvic and iliac sigmoid as well as the lower portion of the descending colon is essential. It should be mentioned that careless manipulation of the bowel by the operator or assistants, either within the abdomen or through the perineum may readily destroy the essential viability. We know that occasionally the retained sphincter musculature may become too active and spastic and contract on the transplanted bowel, strangulating the distal stump, thus causing a slough. This event coupled with the normal retraction may result in the new anorectal line being established higher than usual. It is conceivable that the application of the perineal dressings too tightly may interfere with the blood supply to the stump, and extreme care should be taken to avoid it. Following a slough the resulting train of possible events can be readily appreciated.

Retraction of the bowel stump to a slight degree is a normal sequel and it is for this reason that the bowel is divided distal to the anal margin; this minimal retraction is expected to occur during the first postoperative week. However, extensive retraction into the pelvis is

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a direct result of sloughing of the terminal portion of the stump due to lack of viability. This may take place to such a degree that a secondary infection intervenes, resulting in the deposition of scar tissue with contraction forming a narrow granulating canal and definite incontinence. We have encountered instances of slight retraction above the newly established anorectal line, but such are infrequent and offer no particular problem of management. We have never experienced a slough above the peritoneal reflection.

Infection may follow or accompany sloughing of the bowel stump, but is seldom encountered in the presence of a viable bowel. Prior to 1944 when it was our custom to divide the sphincter musculature in the posterior midline and later reconstruct the sphincter bundles by suture, infection in the presacral space was of common occurrence. With the present technic of performing the perineal dissection within the confines of the sphincter muscle, infection is rarely encountered.

Contraction of the outlet, particularly at the anorectal line, may result from sloughing and retraction with concomitant infection due to the deposition of scar tissue, or by sacrificing more than the minimal amount of anal epithelium.

Incontinence is the result of several factors: (1) division of the sphincter muscle or inaccurate dissection of its bundles, (2) infection resulting in a fibrous stenotic aperture, (3) the tendency to construct the anal opening too small, (4) the excision of an excessive amount of anal epithelium resulting in destruction of the anal canal.

Abscess formation is extremely uncommon; it was encountered in three of our early cases. Presacral sinus occurred on one occasion in our entire series of cases. Perineal hernia developed in two patients which readily responded to simple repair.

Prolapse of the sigmoidal mucosa is not uncommon, and may occur at any time in the postoperative period. This results from faulty judgment in the amount of protruding bowel removed. The exact number of prolapses have not been recorded but it is fair to estimate that perhaps 30 cases have presented prolapse, which on the basis of 391 proctosigmoidectomies would be less than 10 per cent. A few of these cases can be corrected by injection of quinine and urea hydrochloride in 5 per cent solution. Where no improvement is obtained, and particularly where the prolapse descends for a distance of one or two centimeters, simple excision by clamp and suture is recommended, confining the patient to the hospital two or three days. Two of our patients required excision of the external hemorrhoids.

Obstruction, contrary to various opinions, is of infrequent occurrence. It will be recalled that Babcock who, for a period of 17 years, has at no time established a pelvic floor either through the abdomen or through the perineal wound, has never experienced intestinal obstruction as a result of the small bowel descending into the pelvis. Our experience is somewhat different in that while extremely infrequent, it has occurred. It may be mentioned that in all our cases an anterolateral floor is established, usually from the perineal approach.

In our series of cases there have been several instances of obstruction, both dynamic and adynamic, only one of which was fatal. Autopsy examination of this case revealed a loop of small bowel incarcerated in the presacral space resulting in total obstruction and death on the tenth postoperative day. Of the non-fatal cases, four required surgical decompression; two during the first eight day period, one at three weeks and one at two months. In three of these the ileum had become knuckled into the pelvis and all were later mobilized with subsequent closure of the stoma.

The question has frequently been asked: How often has it been necessary for us to perform an abdominal colostomy because of a faulty or unsatisfactory perineal anus? The answer can be truthfully stated that this was done in but two instances. One patient, a male who evidenced local recurrence some twenty months following resection, was treated with radium seeds and a colostomy established. The second case developed melancholia prior to operation which was acentuated during the postoperative period. Her complaint of escaping flatus and numerous evacuations from the accustomed use of laxatives was of such character that a transversostomy was established months following resection. Her complaints still persist and she is equally displeased.

Summary

The criteria are outlined for the various methods in the surgical management of lower bowel cancer. The rates of five year survival, local recurrence and resectability are cited. A comparison of the difficulties in technic between proctosigmoidectomy and the Miles operation is made. The common complications peculiar to abdominoperineal proctosigmoidectomy are discussed in detail.

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Treatment of Epilepsy

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This is the golden age for the childhood epileptic. The attitude of defeatism and bewilderment which has in the past hindered both the diagnosis and treatment of the individual with convulsions has given way finally to one of scientific curiosity and understanding. Great strides in both diagnosis and treatment have been made in the last twenty years.

Etiology

It has been customary to recognize a constitutional tendency to convulsive reactions which is regarded as an inherited peculiarity. Many authors believe that a predisposition to nervous or mental diseases is transmitted to the offspring of epiliptic parents, but that the development of convulsions demands some additional exciting factor which might have no ill effect upon a healthy nervous system. Direct transmission of the disease from parent to child is rare. In about 10 to 15 per cent of cases the history is elicited that some other member of the family was subject to convulsive seizures. In this present series of cases the rate is between 5 and 10 per cent. Cobb states that among a group of 9,139 relatives of epileptics there were 21 cases of epilepsy per 1000. In the general population the instance of epilepsy is about three per thousand. It is impossible, however, to do more than speculate about the nature of this constitutional factor.

Precipitating factors to epilepsy are numerous. All types of diseases of the brain, congenital defects, traumatic injuries, inflammatory and toxic processes may be followed by epilepsy. Penfield has shown in organic epilepsy that it is not the scar, cyst, or tumor tissue, but the surrounding gray matter which is endowed with a peculiar irritability.

While the nature of the cellular defect in the brain is unknown, it is thought by some (Temple Fay and McQuarrie) that the fault lies within the brain cell membrane. Ford at Harriet Lane feels that most cases of idiopathic epilepsy are the result of various cerebral injuries or defects that occur in utero, at birth, and in early infancy.

Pathology

Post mortem examinations have revealed no constant anatomical basis underlying the various types of epilepsy. In a few instances no pathological changes whatever are found, but in the great majority of cases, gross lesions of some type are present. Southard and Thom found at autopsy only 68 brains which seemed to be normal in the *gross,* out of a total of 205 brains of epileptics. Most often found are thickening of pia-arachnoid, circumscribed or diffuse atrophy of the cortex, loss of neurons of the superficial layers of the cortex and proliferation of fibrous glia, porencephaly, microgyna, anomalous distribution of cortical blood vessels and many other gross defects. In brains which seem to be normal in the gross, microscopic examination reveals both acute and chronic changes. Usually found are focal areas of the cortex in which the neurons have disappeared and been replaced by a dense overgrowth of neuroglia. These foci are found most frequently in the cornu Ammonis and in the cerebellar cortex.

Electro-encephalogram

Berger first described the electrical beat of the brain in 1929. Since that time the anatomic, physiologic and psychic correlates of the electro-encephalogram have been studied intensively by many workers.

In the normal waking state, the brain does not beat as a single unit but as many small more or less independent units with ill defined boundaries. Complex waves are the result of superimposed beats from different types of functional units. The electro-encephalograph does not record activity at any great distance. Only activity taking place immediately under an electrode shows in the records. The beating of the brain becomes faster and shallower with stimulation and particularly with attention. It slows and develops a high amplitude with deep sleep. It varies greatly from person to person but tends to remain more or less characteristic for each individual. Diseases of the brain tend to produce definite disturbances in the brain beat, and it is this faculty of which we take advantage in the diagnosis of epilepsy.

Epilepsy is associated with extreme modification of the cortical beat, not only at the time of the seizure but in intervals between seizures. Unfortunately, about 10 per cent of the supposedly normal population have cerebral dysrhythmias which are similar to those of the epileptic patient; so that it is not without danger to make a diagnosis of epilepsy from the electro-encephalogram alone. About 20 per cent of patients with definitely clinical epilepsy have a normal electro-encephalogram. In this series of patients, 16 per cent have normal electro-encephalograms. We have felt, as do Gellhorn, Abbott, and Schwab, that the normal electro-encephalogram in a patient with clinical epilepsy suggests that the disease is not advanced or diffuse enough to cause an irregular tracing. For that reason these patients have a better prognosis than those epileptics who have an abnormal tracing.

Onset

About 10 per cent of all cases of epilepsy can be traced back to the first three years of life, and nearly 50 per cent develop before the age of ten years. Isolated convulsions associated with fever, usually seen in children four years and under, have between a 10 and 20 per cent chance of being associated with epilepsy at

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some later date. Several of the patients in this series began in this way.

IDIOPATHIC EPILEPSY

Description of Seizures

There is no such thing as a typical fit or seizure, individual seizures being almost infinitely varied.

Grand Mal. A generalized convulsion, tonic and then clonic, involving the whole body. The patient is unconscious during the spell, which may last from a few minutes to many hours, and then lapses into a deep sleep when the spell has subsided. The convulsion is usually preceded by an aura of some type in contradistinction to the minor spells which are not preceded by aura.

Petit Mal. A momentary or transient loss of consciousness lasting from five to thirty seconds. The patient is usually quiet, and muscular movements, if any, are confined to rhythmic jerking of the eyelids or the brow and rarely clonic movements of the head and arms. These attacks recur usually many times a day. There is no aura or after symptoms. Seizures begin and end abruptly. Rarely the patient is in a state of confusion lasting a few hours, after a number of seizures. The seizures are more likely to occur in the morning shortly after getting out of bed. They may be precipitated by emotion, excitement, or in girls by menstruation, and are much *less frequent* during physical or mental activity. There is some difference of opinion concerning Lennox's statement that petit mal attacks tend to disappear by themselves before the age of twenty.

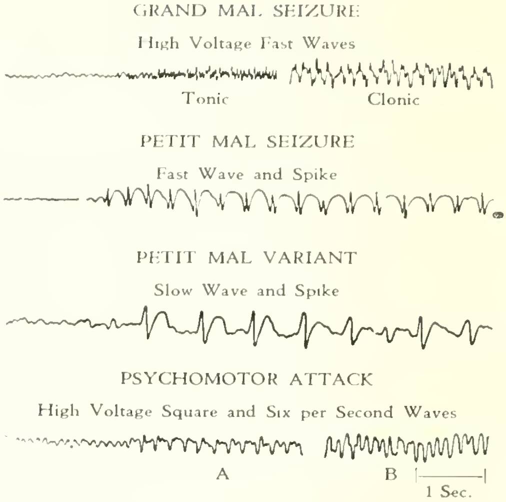
Myoclonic Epilepsy. Myoclonic shocks are single contractions of arm or trunk muscles without apparent loss of consciousness. These are similar to the muscular jerks which many healthy persons experience upon falling asleep. Myoclonic shocks are innocuous, and usually occur in association with petit mal.

Akinetic Epilepsy consists of a sudden loss of postural control, with nodding of the head, or if generalized, a sudden fall. The child collapses without any warning. Usually he gets up right away, but he may have dozens or even hundreds of attacks a day. Treatment of this type of epilepsy is not as encouraging as that of the other types, as there is usually an association with birth trauma, asphyxia, or encephalitis.

Psychomotor Equivalent — a period of amnesia with or without tonic spasm of trunk muscles. The child may appear to act in a normal manner or to be confused or mutter, make chewing motions or run around in a wild manner. He has no memory of events during the attacks.

Petit mal, myoclonic epilepsy and akinesis have a number of characteristics in common: Great frequency, brevity of attacks, abrupt onset and termination, maintenance of mentality, sensitivity to changes in the acid base balance or in the concentration of oxygen or of sugar in the blood, a strong tendency to spontaneous recovery with age, resistance to usual anti-convulsant drugs and immediate response to Tridione.

The electro-encephalogram in the patient with grand mal reveals generalized high voltage fast, 15 to 50 per second waves (see Figure 1). In petit mal, myoclonic epilepsy and akinesis it reveals high voltage alternate spike and wave complexes repeated three times a second with minor variations. Psychomotor attacks show slow flat topped waves with numerous superimposed small waves giving a saw tooth appearance, or slow four to six per second sinusoidal waves of high voltage.



The four different patterns of waves observed during four different types of seizures, grand mal (including jacksonian and focal), petit mal (also called pykno-epilepsy), petit mal variant (in which the association of seizure discharges and clinical symptoms may be vague or absent) and psychomotor. In each case the left hand portion of the tracing is the person's normal record. "A" and "B" in the bottom tracing represent different stages in this particular patient's seizure. The horizontal line at the bottom indicates one second, and the perpendicular lines at the right the signal made by 50 or 200 microvolts of current. (Gibbs, F. A., Gibbs, E. L., and Lennox, W. G.: Arch. Neurol. & Psychiat. 41:1111 [June] 1939.)

CASE REPORTS

We have seen 86 children with spells serious enough to demand a complete work-up in the last four years. Twenty-six of these had a demonstrable cause and 60 were idiopathic. Fifteen of the children with an organic epilepsy showed mild internal hydrocephalus with cortical atrophy, 10 had subdural hematomas and one child had a left porencephaly.

Of the 60 children with idiopathic epilepsy, 15 have petit mal, including myoclonus and akinesis, 18 have grand mal types of seizures, 23 have a mixture of petit and grand mal and three have suggestive psychomotor attacks.

All of the 15 children with petit mal type of convulsions are in excellent control with Tridione alone. Until the discovery of Tridione a few years ago these children were very difficult to control. The petit mal type of seizure does not respond to sodium dilantin or to phenobarbital, and the response is only fair to fluid limitation and ketogenic diet. There is much difference of opinion concerning the efficacy of the ketogenic diet and fluid restriction. We have felt that it has seemed to help some of these children; however, the response of the child with petit mal to Tridione is dramatic. Almost without exception the seizures stop within the first week

Table: GUIDE TO MEDICAL TREATMENT OF EPILEPSY‡

Type of Epilepsy	*Medication*	*Average Dose**	*Limiting Side Effects*	*Signs of Sensitivity*
Grand Mal Focal	Dilantin	1½ gr. three times a day after meals. Usual maximum, 6 gr. per day	Diplopia, staggering, may increase petit mal	Overgrowth of gums or body hair, itching rash on extremities, gastric irritation
	Phenobarbital	1½ gr. at bedtime. Usual maximum, 3 gr. per day	Sleepiness	
	Mesantoin	1½ gr. three times a day. Usual maximum, 6 gr. per day	Sleepiness	Scarlatiniform rash† fever, lymphadenopathy
Petit Mal Myoclonic	Tridione, with monthly white count	1½ gr. three times a day	Inability to see in a bright light, drowsiness	Hiccoughs, acneform rash, leukopenia†
	Mebaral	6 gr.	Sleepiness	
	Ketogenic diet			Loss of Weight
Psychomotor	Any and all anti-epileptic substances. Medical treatment generally unsatisfactory.			

* Dose to be raised until seizures are controlled or limiting side effects or sensitivities develop.
† Requires omission of responsible drug.
‡ Modified from Fred. Gibbs.

after treatment is started.

All of the 18 children with grand mal seizures are receiving sodium dilantin alone or in combination with phenobarbital or meboral. The results are uniformly good among these children, although the seizures do not respond as well as do the petit mal seizures to Tridione.

Our most difficult problems are the 23 children with mixed petit and grand mal types of seizures. In the first place the correlation between the electro-encephalogram and the types of spells is not nearly so close as in the first two groups discussed. Furthermore, these children have much more varied symptoms such as pallor, dizziness, faintness, vomiting, blushing, attacks of screaming at night, and headaches, as well as generalized convulsions. Probably because of the varied type of convulsions as well as the specificity of the present day drugs, the results are not as good as in the pure type of epilepsy. In most children the administration of Tridione made the major spells worse, whereas the administration of sodium dilantin while it controls the major spells, does not affect the minor spells. In most of these situations we have accepted the minor spells and attempted to control the major ones.

Three children ranging in age from four to twelve have very suggestive psychomotor attacks. In one, a twelve-year-old boy, the electro-encephalogram was abnormal while in the other two children the tracings were normal. One of the children has had an abatement of his attacks since taking sodium dilantin.

We have attempted with each child to use the drug considered the most effective for the type of disease concerned. Usually a relatively small dosage is started with and then the dosage is gradually increased until seizures are prevented or tolerance is reached.

Figure 2 illustrates the types of drugs used, usual dosages and correlation with type of epilepsy. Unless the electro-encephalogram was negative we have followed it in selecting our drug rather than the clinical story.

Side Effects of Anti-epileptic Drugs

Phenobarbital. The side effects of phenobarbital are a scarletina-like rash, in the occasional allergic individual, or drowsiness, if the dose is excessive. One child, a 3-year-old boy, was in a stupor for 1½ weeks following an excessive dose of phenobarbital.

Sodium Dilantin. Sodium dilantin does not have the sedative effect of phenobarbital. The side effects most frequently encountered are muscular incoordination, gastric distress, skin eruptions, and enlargement of the gums. Side effects with sodium dilantin are rare in my experience.

Tridione. The commonest side effect of Tridione is photophobia, which may clear up as the drug is continued. A rare but dangerous side effect is the occurrence of agranulocytosis so that white blood cell counts and platelet counts should be taken in patients receiving tridione at not less than two weekly intervals.

Mesantoin. Sensitivity is indicated by a scarletinaform rash, swollen lymph glands in scalp and neck, and by fever. One person in ten is sensitive to mesantoin. It is clinically reserved until after dilantin and phenobarbital have been tried. It did not affect the generalized convulsions in one patient.

Summary

1. The present-day treatment of idiopathic epilepsy in childhood is much more gratifying both to physician and patient than ever before.

2. The use of history, physical examination and laboratory methods to rule out organic epilepsy followed by an electro-encephalogram in the idiopathic type produces the highest percentage of correct diagnoses.

3. The correlation between the clinical description of an attack and the electro-encephalogram is very high. In several children where the clinical description of the convulsion and the electro-encephalogram were at variance the child was treated according to the electro-encephalogram with gratifying results.

4. A normal tracing in a patient with clinical epilepsy usually is an indication that the disease is not as widespread as if the tracing were positive and consequently the prognosis for stopping the convulsions is better.

5. Specific drug therapy is now available for each type of idiopathic epilepsy.

6. The prognosis in idiopathic epilepsy is best for petit mal, next for grand mal, and worse for combinations of the two.

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DR. M. C. SOSMAN TO GIVE LEO G. RIGLER LECTURE

The annual Dr. Leo G. Rigler Lecture in Radiology will be given by Dr. Merrill C. Sosman, Professor of Radiology, Harvard University, on Thursday evening, October 28th, at 8:00 P.M., in the Auditorium of the Museum of Natural History, University of Minnesota. Dr. Sosman will speak on the subject "Roentgenological Aspects of Heart Disease". The Rigler Lectureship was established in 1944 by colleagues, former students and friends of Dr. Rigler in recognition of his contributions in teaching and research in radiology. He has been Professor of Radiology and Chairman of the Department of Radiology of the University of Minnesota since 1926.

Dr. Sosman's lecture will be given in connection with a Continuation Study Course in Cardiovascular Roentgenology, October 25 to 30, at the Continuation Center of the University. The participating faculty will be: Dr. Richard Bing of Baltimore, Md., Dr. Fred Jenner Hodges of Ann Arbor, Mich., Dr. Marcy Sussman of New York, and Dr. Sosman. In addition, the graduate faculty of the Mayo Foundation and the University of Minnesota will participate.

PHI DELTA EPSILON MEDICAL LECTURESHIP

The second annual Phi Delta Epsilon medical lectureship will be given at the University of Minnesota medical sciences amphitheater, 8 P.M., November 3, 1948. The essayist is Franklin Hollander, Ph.D., Head of the Gastroenterology Research Laboratory of Mount Sinai Hospital (New York City) on the subject "Studies in Gastric Secretion." The lecture is presented under the combined auspices of the University of Minnesota medical school, the Phi Delta Epsilon undergraduate fraternity and the Minnesota Phi Delta Epsilon graduate club.

Acute Poliomyelitis Treated with Thermal Antibody

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Twenty consecutive cases of acute poliomyelitis were treated during the 1946 season with thermal poliomyelitis antibody.

The table shows the important details concerning each patient. In this series the first case had its onset in July and the last case in November. The ages varied from 2½ years to 16 years. Fourteen of the patients were boys and six were girls. Fever was present at the onset in all the cases. Stiffened neck and back was constant at the onset and a positive Brudzinski sign was obtained in each case. Vomiting and nausea occurred at the onset in five patients. Paralysis or weakness was evident when first seen in seven of the cases. Case 16 was the only patient that developed more paralysis after the administration of the thermal antibody. The reaction which occurred with this patient several hours after the injection of the antibody was probably due to the low pH of the antibody which since then has been brought to between 6.0 and 6.5. It was during this reaction that more paralysis developed. After the reaction subsided, as indicated by normal temperature, no further weakness or paralysis occurred, instead a very slow, gradual return of muscular activity took place. The other six patients in this group with paralysis or weakness, after having received the thermal antibody did not develop more weakness or paralysis.

Of the whole series of twenty patients, five either had difficulty in swallowing or could not swallow. Two of these belong to the preparalytic group since they had difficulty in swallowing, but could swallow. This difficulty disappeared by the second day in case 1, and in case 20 by the fifth day after receiving the thermal antibody. The three patients that could not swallow received temporarily nothing by mouth, and in one to five days after receiving the thermal antibody were again able to swallow.

The right arm was weak in two cases, the left arm in one case; and paralyzed in one case. In one patient the right leg was weak, and in one it was paralyzed; in one the left leg was weak and in two it was paralyzed. In one case the abdominal muscles were paralyzed. In three patients the intercostal muscles were weak or paralyzed.

Thirteen of the patients in this series were preparalytic. No muscular weakness or paralysis was present. However, four of these patients had painful muscles, involving extremities in three cases, and muscles of swallowing in the fourth. Lost or absent reflexes were observed in ten of these patients. None of the preparalytic patients developed any muscular weakness or paralysis.

The spinal fluid cell count varied from 0 to 172. In three patients the number of cells were over 100, two being preparalytic with lost reflexes and one with paralysis; in ten cases the cell counts were between 10 and 100, five of these had definite weakness or paralysis, the other five were preparalytic and had lost reflexes. Seven patients had cell counts less than 10, of these one could not swallow, one had difficulty in swallowing, and five had painful muscles and absent reflexes.

The thermal poliomyelitis antibody was given intramuscularly into the lateral aspect of the thigh in all twenty cases. The amount varied from 15 cc. to 40 cc. Eight patients received 15 cc. each, two received 20 cc. each, one received 25 cc., eight received 30 cc., and one received 40 cc. The dose varied with the severity of the illness and somewhat with the size of the patient. Only one patient, case 16, had a very painful local reaction accompanied by a generalized reaction with a fever up to 104 R. which gradually subsided after four days to a normal temperature. Seventeen patients had only a local reaction of pain, slight to moderate, which did not develop a local redness, and two patients had no reaction or pain.

Improvements noted were: that of the patients with difficulty in swallowing, case 1 could swallow normally in twenty-four hours; case 14 could swallow satisfactorily within three days after the first dose and twenty-four hours after the second dose of thermal antibody; case 16 could swallow normally again on the fifth day after receiving the antibody; case 19 could swallow normally two days after the antibody was given; and case 20 could swallow again five days after receiving the thermal antibody. Of those patients with respiratory difficulties none needed the respirator; case 14 could use his intercostal muscles to some extent within twenty-four hours after receiving the thermal antibody; case 16 could use his intercostal muscles much better on the fifth day after receiving the antibody; case 19 showed improvement in the use of his intercostal muscles in forty-eight hours and was breathing normally in five days after receiving the thermal antibody. Those with painful muscles: case 1, the pain in his right arm disappeared on the third day after receiving the antibody; case 5, the pain in the left arm disappeared six days after the thermal antibody was given. Cases 7 and 10, the pain in the left leg was gone in four days and five days, respectively, after receiving the antibody.

During this season untreated cases of acute poliomyelitis already having paralysis did develop more paralysis. Some untreated patients in the preparalytic stage and with hyperæsthetic muscles after a few days developed paralysis. Other patients with paralysis already present and treated with convalescent poliomyelitis serum continued to develop more paralysis and several died.

TABLE: TWENTY CONSECUTIVE CASES OF ACUTE POLIOMYELITIS

Case No.	Age	Date of Onset	SYMPTOMS AND FINDINGS	Spinal Fluid (Clear, under pressure)	Thermal Antibody: Date and Amount Injected Intra-muscularly
1	5½ yrs.	7-26-46	Diarrhea, fever, stiff neck and back. Pain in right arm, weak right hand grasp. Could not swallow saliva. Pos. Brudzinski.	Ross Jones trace, Cell count 2	7-27-46—15 cc.
2	4 yrs.	7-25-46	Fever, stiff neck and back. Positive Brudzinski. No muscular weakness. Has absent reflexes.	Ross-Jones + Cell count 14	7-28-46—15 cc.
3	3 yrs.	7-29-46	Fever, stiff neck and back. Positive Brudzinski. No lost reflexes. No weakness.	Cell count 46	7-30-46—15 cc.
4	6 yrs.	8-14-46	Fever, nausea, backache. Abdominal reflexes absent. Positive Brudzinski.	Cell count 1	8-15-46—15 cc.
5	9 yrs.	8-11-46	Fever, pain in left arm and weak, stiff neck and back. Positive Brudzinski.	Cell count 93	8-12-46—15 cc.
6	12 yrs.	8-13-46	Fever, stiff neck and back. Positive Brudzinski. Abdominal reflexes absent.	Cell count 3	8-14-46—15 cc.
7	11 yrs.	8-10-46	Fever, painful to bend neck forward. Left leg painful and limp.	Cell count 27	8-17-46—20 cc.
8	12 yrs.	8-18-46	Fever, stiff neck and back. Positive Brudzinski. Abdominal reflexes absent.	Cell count 1	8-18-46—30 cc.
9	3 yrs.	8-23-46	Fever, stiff neck and back. Positive Brudzinski.	Cell count 32	8-23-46—15 cc.
10	8 yrs.	8-24-46	Fever, stiff neck and back. Lost reflexes. Painful left leg.	Cell count 2	8-24-46—15 cc.
11	13 yrs.	8-24-46	Fever, nausea, headache, stiff neck and back. Absent reflexes. Painful left leg.	Cell count 15	8-25-46—20 cc.
12	12 yrs.	9-3-46	Fever, headache, vomited, stiff neck and back. Absent reflexes.	Cell count 145	9-5-46—30 cc.
13	16 yrs.	9-4-46	Backache, fever, vomited. Stiff neck and back. Lost reflexes.	Cell count 69	9-8-46—30 cc.
14	2½ yrs.	9-7-46	Fever, vomited, painful legs, intercostal muscles paralyzed, both legs paralyzed. Difficulty in swallowing.	Cell count 94	9-12-46—15 cc. 9-14-46—15 cc.
15	4 yrs.	10-10-46	Fever, drowsy, fell down when tried to walk. Stiff neck and back.	Cell count 19	10-11-46—25 cc.
16	9 yrs.	10-12-46	Fever, headache, twitching left leg. Right leg painful. Left leg paralyzed. Intercostal muscles weak. Difficulty swallowing.	Cell count 172	10-14-46—40 cc.
17	8 yrs.	10-19-46	Fever, headache, vomiting. Stiff neck and back. Lost reflexes.	Cell count 2	10-21-46—30 cc.
18	4 yrs.	10-23-46	Fever, headache, painful legs, stiff neck and back. Lost reflexes.	Cell count 103	10-24-46—30 cc.
19	3 yrs.	10-25-46	Fever, vomited, painful left arm, paralysis left and right arms, head drop, paralyzed abdominal muscles. Difficulty in swallowing and breathing.	Cell count 107	10-29-46—30 cc.
20	7 yrs.	11-19-46	Fever, headache, difficulty in swallowing. Stiff neck and back. Positive Brudzinski.	Cell count 0	11-19-46—30 cc.

None of the patients treated with the thermal poliomyelitis antibody died, and only one patient, case 16, developed more paralysis after receiving this treatment. The remaining 19 cases were free from pain sooner and moving about actively in a short period of time.

The poliomyelitis thermal antibody was prepared by Dr. E. C. Rosenow who kindly supplied the amount needed for the twenty patients. In the preparation of this artificial antibody, Dr. Rosenow states that "it has been found that as the bacteria (streptococci isolated from cases of poliomyelitis) disintegrate in NaCl solution suspension on application of heat in the autoclave, the toxic components are destroyed—and substances resembling antibodies become demonstrable in the supernatant NaCl solution. Optimum yields of 'antibody' are best obtained by autoclaving suspensions in NaCl solution for 96 hours, and for one to three hours at pH of 2.0 to 4.0 after adding 1.5 per cent of hydrogen peroxide, and at 100° C. for one hour in oxygen under 2000 pounds pressure per square inch.

"The solutions of 'antibody' used in treatment were prepared by autoclaving suspensions in isotonic NaCl solution containing 20 billion streptococci per cubic centimeter isolated in studies of poliomyelitis for 96 hours without hydrogen peroxide, and 10 billion per cubic centimeter for one to three hours after adding 1.5 per cent hydrogen peroxide. Both types contained the antibody and residual largely detoxified antigen from 5 billion streptococci per cubic centimeter. The streptococci had been preserved prior to the preparation of antibody in very dense suspensions of glycerine 2 parts and saturated NaCl solution 1 part."

TREATED DURING 1946 WITH THERMAL POLIOMYELITIS ANTIBODY

Reaction from Thermal Antibody	Date First Improvement Noted	REMARKS
Slight pain at site of injection	Could swallow saliva the next day. On 7-30-46, pain in right arm and back gone.	On 8-4-46—Up and walking about in his crib. On 8-10-46 discharged from hospital. No muscular weakness.
Slight pain at site of injection	7-30-46—All reflexes present again.	8-8-46—Discharged from hospital. No weakness.
No pain at site of injection	Temperature normal since 8-1-46.	8-4-46—Up and about in his crib. 8-12-46—Discharged from hospital. No muscular weakness.
Slight pain at site of injection	Temperature normal since 8-16-46.	8-18-46—Neck and back flex much better. 8-29-46—Discharged from hospital. No muscular weakness.
Slight pain at site of injection	8-18-46—Left arm stronger.	11-15-46—All weakness gone. Has normal strength.
Slight pain at site of injection	Temperature normal since 8-15-46.	8-25-46—All reflexes present again. 8-28-46—Discharged from hospital. No muscular weakness.
Slight pain at site of injection	8-25-46—Neck and back less stiff.	9-8-46—Discharged from hospital. 10-15-46—No limp.
Site of injection painful for about 5 days	Normal temperature since 8-25-46.	8-28-46—Discharged from hospital. Reflexes (abdominal) absent, but no muscular weakness.
No pain at site of injection	Normal temperature since 8-25-46.	9-7-46—Discharged from hospital. No muscular weakness.
Slight pain at site of injection	Normal temperature since 8-29-46.	No muscular weakness. Slight spasm in leg if overdoes.
Slight pain at site of injection	Normal temperature since 8-26-46.	9-7-46—Discharged from hospital. No muscular weakness.
Slight pain at site of injection	Normal temperature since 9-8-46.	9-18-46—Discharged from hospital. No muscular weakness.
Slight pain at site of injection	Normal temperature since 9-10-46.	9-19-46—Discharged from hospital. No muscular weakness. Abdominal reflexes absent.
Slight pain at site of injection	9-25-46—Muscles stronger	9-13-46—Intercostal muscles working some, color good. 9-15-46—Swallowing easier. 10-25-46—Foot drop still marked.
Slight pain at site of injection	Normal temperature since 10-15-46	10-20-46—No muscular weakness, walked about in crib very well.
Very painful local reaction and generalized reaction for 5 days.	Normal temperature since 10-19-46.	10-19-46—Could swallow normally. Breathing normal. Gradually regaining use of muscles in both legs, slower in the left leg.
Very slight pain at site of injection	Normal temperature since 10-23-46.	11-3-46—Discharged from hospital. All reflexes returned. No muscular weakness.
Very slight pain at site of injection	Normal temperature since 10-26-46.	11-8-46—Discharged from hospital. All reflexes present again. No muscular weakness.
Very slight pain at site of injection	Normal temp. since 11-1-46. Could swallow normally in 2 days. 11-5-46–Resp. muscles normal again.	Gradually regaining use of abdominal muscles, also right arm. The left arm is improving more slowly.
Slight pain at site of injection	Normal temperature since 11-24-46.	After 11-23-46 could swallow without difficulty.

In conclusion: This thermal antibody for acute poliomyelitis contains no horse serum, and delayed reactions did not occur. With the pH adjusted to between 6.0 and 6.5 this artificial antibody caused small local reactions and in some cases no reactions. This antibody would seem to have curative effects in poliomyelitis and in returning the patient to normal activity in a relatively short space of time.

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AMERICAN STUDENT HEALTH ASSOCIATION

Neurologic Findings Among College Students

Robert B. Clarke, M.D., Detroit, Michigan
Theophile Raphael, M.D., and Martha R. Westerberg, M.D., Ann Arbor, Michigan

Since the establishment of the Mental Hygiene service in 1930 as a full-time function, indication for neurological evaluation among students coming to its attention has shown itself a matter of increasing significance. This led finally to the formal inclusion in the department of personnel specifically trained in this field. It was felt that the findings noted might well have practical bearing not only for mental hygiene departments, whether for students or others, but for medical units generally. Topically, it is pertinent this aspect has recently presented itself in connection with the expanding mental hygiene services being offered by the Veterans Administration.

The present report summarizes the last full year's experience neurologically of the Mental Hygiene unit of the Universtiy of Michigan Student Health Service. During this period, July 1, 1946, through June 30, 1947, 1,699 students were seen, and 367 of these, i.e., 21.6 per cent or roughly one in five, were referred for neurologic appraisal. The student enrollment for the period covered was 23,555.† At this point it is of interest that

The neurologic service at Michigan was supplied partly by one of the full-time psychiatrists of the unit with neurological training and by a neurologist from the University Hospital giving some four hours a week. At present the service is furnished by a University Hospital neurologist giving seven hours a week, supplemented in very small degree by the full-time psychiatric personnel of the department. This amount of neurologic specialist time, however, is not adequate and for the present semester enrollment, 19,731,* ten hours per week suggests itself as a more satisfactory minimum provision.

Of the above mentioned 367 students presenting special neurologic indication, 283 were men and 84 women, a ratio of 3.4 to 1. This is a higher men-to-women ratio than obtained for the total number of persons seen by the Mental Hygiene Unit, 2.1 to 1, and for the university as a whole, 2.5 to 1. Incidentally, a greater number Washburne[1] at the University of Wisconsin recently reported 414 student neurological cases over a seven year period.

of men as compared to women was noted by Washburne also.[1] Further detail pertaining to sex distribution in this series is included in Table 1.

The number of neurologic visits or contacts, it may be added, totalled 740, or an average of 2. Many of this group, however, were seen frequently in the Mental Hygiene Unit in connection with other aspects.

In 195 of the series of 367, a neurological or somatic diagnosis was determined and among these there were, of course, many students with associated emotional or personality adjustment problems. In 106 of the 367, the complaints were felt to be functional in origin and in 52 no neurological or psychiatric diagnosis was made. Fourteen of the 367, it should be added, as of June 30, 1947, had not yet been diagnosed.

For convenience, the series has been broken down into eight categories representing the primary complaint for which the student was referred to the neurologist.

TABLE 1

	Male	Female	Total
Total Series	283	84	367
1. Headaches	104	33	137
2. Peripheral sensory disturbances	58	8	66
3. Fainting, dizziness or seizures	45	12	57
4. Motor disturbances	33	14	47
5. Head injuries	20	3	23
6. Acute febrile illnesses	12	7	19
7. Excessive sleepiness	5	2	7
8. Miscellaneous	6	5	11

With regard to the first category, the complaint of headaches is of course a very common one. However, as far as can be determined respecting the 137 students with this complaint referred for neurologic opinion, there were special reasons, such as severity, duration or other specific clinical features and implications. In 61 of the 137 so referred a diagnosis of psychoneurosis or psychoneurotic reaction was made and of migraine in 42, with the psychogenic factor of especial significance in 24 of the latter. In 3 a diagnosis of Horton's headache was determined and in the case of 2 students, both South Pacific veterans, malaria was found to be the causal agent.

In relation to headaches, fear of brain tumor by the student or by the referring source was not uncommon and every attempt was made carefully to evaluate this possibility. If the history or the examination revealed any evidence of increased intracranial pressure or of localizing signs, further studies were requested, namely X-ray of the skull, examination of visual fields and fundi by an ophthalmologist, spinal fluid examination,

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Read at the twenty-sixth annual meeting of the American Student Health Association, Detroit, Michigan, May 7, 1948.

From the Mental Hygiene Unit, Student Health Service, University of Michigan, Ann Arbor, Michigan.

*Pre-final, five-week figure.

†Includes first and second semesters and summer session, but corrected for duplicate registrations. For the academic year, as such, the enrollment was 18,834 and for the summer session, including duplicate registrations, 9,533.

and electroencephalographic studies. In this connection should be stressed the importance in general of basic competence in fundus evaluation for the physician engaged in student health work.

In the treatment of migraine, allergic appraisal, either by skin tests or food diary, is indicated. Also, in these cases, ergotamine tartrate by mouth when the aura first appears is helpful in diminishing or preventing the headache. Likewise, constructive psychotherapeutic procedure with adequate realization of the pathodynamic potential of basic emotional drives, especially hostility or anger, has demonstrated itself as of great importance. With reference to Horton's headache, it should be mentioned, the importance of histamine desensitization should be borne in mind.

Four students, incidentally, who presented themselves primarily because of headaches, gave a history of convulsive disorder.

Headache, it should be emphasized, though common, may represent quite a difficult problem and each case should be evaluated individually and carefully with attempt to establish a definite and complete etiology. This ofter requires time and effort on the part of the student, but the results can be very gratifying.

The second category comprised 66 students, 58 of them men, seen because of numbness, paresthesia, pain, tinnitus or disturbance of vision. A diagnosis of sciatic neuritis, due to protruding intervertebral disc, was established in 9. Cervical radiculitis, with suspected protruding disc, occurred in 3, and the scalenus anticus syndrome was noted in 4. Two students presented signs and symptoms of multiple sclerosis. Nerve deafness was present in 4 students, but in 2 of these an accompanying neurosis was an important aspect. Also there were 2 cases of retrobulbar neuritis.

Fifty-seven students came to attention because of complaints of seizures, dizziness, or fainting. Detail as to this series appears in Table 2.

Table 2

	Grand Mal	Petit Mal	Psycho-motor Attacks	Secon-dary Epilepsy*	Other** Condi-tions
Male	17	5	2	2	19
Female	1	0	0	1	10
Total	18	5	2	3	29

*Epilepsy secondary to organic brain disease.

**(Definitive diagnoses only) Psychoneurosis or psychoneurotic reaction 12, labyrinthitis 5, Meniere's syndrome 3, hypoglycemia 3, hypothyroidism 1, simple syncope 1.

From this, it will be seen that convulsive disorder occurred in 28, with definitely greater frequency among the men, a trend previously noted.[2] This figure does not include the four students already mentioned in connection with the headache group who also had history of seizures. In 12 of the 28, incidentally, the diagnosis of convulsive disorder was first established during the period in which this study was made.

The policy in treatment of convulsive disorders was to attempt to eliminate the attacks entirely, not simply to decrease them. Dilantin, Tridione and/or phenobarbital were used in varying dosages, determined on an individual basis. In this connection the importance of orientation of the physician in the student health field respecting the modern therapeusis of convulsive disorders is obvious.

In the next category were 47 students seen because of various motor disturbances. The findings for this group are summarized in Table 3.

Table 3

1. Tremors or "twitching"	15
Anxiety	12
Familial Tremor	2
Diffuse CNS disease with cerebellar involvement	1
2. Cerebral diplegia	5
3. Poliomyelitis (old)	3
4. Chronic encephalitis	3
5. Progressive muscular dystrophy	2
6. Bell's palsy	3
Acute	2
Old	1
7. Spinal cord injury (old)	2
*8. Other conditions	14

*(Definitive diagnoses only) Traumatic neuropathy N. tibialis 1, traumatic peroneal nerve palsy 1, aphasia 1, post-traumatic organic brain syndrome 1, pseudo-hypertrophic muscular dystrophy 1, contracture of feet 1, psychoneurosis 1.

Twenty-three students (20 men) were seen because of history of head injury. A diagnosis of concussion was made in 4, and a tentative diagnosis of hemorrhagic labyrinthitis in one. Regarding this category, the following policy with respect to request for neurological consultation was established. If, following head injury, there was a period of unconsciousness and the student developed signs of increased intracranial pressure (severe headaches, nausea, vomiting, etc.), or localizing signs, a skull X-ray and neurological consultation were requested. If the student experienced loss of consciousness for a brief period but had no signs of increased intracranial pressure or localizing signs a skull X-ray was obtained and only if this revealed some abnormality was a neurological examination requested. If there was no loss of consciousness and no localizing signs or signs of increased intracranial pressure, neither a skull X-ray nor neurological consultation was felt to be necessary.

Comprising the sixth category were 19 students with acute febrile illness due to or with questionable neurological disease. One was found to have acute anterior poliomyelitis, one encephalitis, and a third acute fulminating streptococcus meningitis. In these conditions the prodromal signs can be vague and the value of having neurological assistance in the establishment of an early diagnosis cannot be underestimated.

Seven students complained of excessive sleeping, with narcolepsy occurring in three and hypothyroidism in one. Also in three instances the difficulty was felt to be psychogenic in nature.

In the last or miscellaneous category were included 11 students presenting a variety of complaints and conditions with final definitive diagnoses as follows: psychoneurosis or psychoneurotic reaction 7, old visual field defect due to thrombus 1, myasthenia gravis 1 and somnambulism 1.

To summarize, during the year covered by the foregoing, over 20 per cent of the students seen by the Mental Hygiene Unit were referred for neurologic check, with positive findings not infrequently of major type in the case of approximately half that number. For these, of course, such examination was definitely essential. So also was it important for the great majority of the others if only for the purpose of elimination, irrespective for this as well as the positive group of the question of the occurrence of psychological and emotional difficulties. That is, for mental hygiene or psychiatric function, implementation simply for the psychogenic, patently, is insufficient. Further, there were numerous special situations more or less of emergency type, such as head injuries, convulsions and suspected meningitis or poliomyelitis, when prompt and absolute competent evaluation admittedly is imperative if the service offered is to be regarded as in any sense adequate.

In conclusion, assuming the Michigan experience, and that of Wisconsin, to be reasonably representative it is obvious that neurologic facility is a definite and substantial need for college mental hygiene units. By the same token it may be taken to constitute just as definite a need for similar departments dealing with other groups, and for medical services as such not provided with special mental hygiene departments. This need may not be as sharply realized in all quarters as would be desirable and emphasizes the importance, of course, of specially qualified personnel. Also important is effective orientation of physicians generally, to make possible proper detection and to enable the adequate handling of situations not requiring the technical neurologic expert or handling up to the point where such referral does become indicated. From the present experience, too, it suggests itself in a practical way that for college populations, at any rate, the technical neurologic requirement could be minimally satisfied by services available at the rate of one-half hour per week per 1,000 of student enrollment. For schools exclusively for men, however, the service needed might perhaps be slightly greater and for women's colleges slightly less.

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2. Raphael, T., and Himler, L. E.: Schizophrenia and Paranoid Psychoses Among College Students. Am. J. Psychiatry 100:4, 443-451 (Jan.) 1944.

. . . MEET OUR CONTRIBUTORS . . .

Arthur F. Abt, M.D., is an associate professor of Pediatrics at Northwestern University, Evanston, Illinois. He is a Fellow of the American Academy of Pediatrics; member of the American Pediatric Society, Society for Pediatric Research, Institute of Medicine of Chicago, Chicago Pediatric Society, Pediatrician on the Northwestern University Medical School Poliomyelitis Epedemic Aid Unit of the National Foundation for Infantile Paralysis; is a graduate of Johns Hopkins Medical School, class of 1923.

Harry E. Bacon, M.D., F.A.C.S., F.I.C.S., F.A.P.S., F.R.S.M., professor and head of the Department of Proctology, Temple University, Philadelphia, Pennsylvania, from which he graduated in 1925.

He has memberships in the following: Amercian College of Surgeons, American Protologic Society, Philadelphia Protologic Society, The American Cancer Society, International College of Surgeons and honorary memberships in: Detroit Academy of Surgery, Hollywood Academy of Medicine, Venezuelan Surgical Society, Peruvian Surgical Society, Ambrose Paie Surgical Socity, Mienontese Surgical Society, Miembra Correspondiente Extranjero De Argentina. He is president, American Protologic Society; director, American Cancer Society; trustee, International College of Surgeons.

George D. Vaughan, M.D., was graduated from the Medical College of Virginia in 1939; is now an associate in Proctology, Temple University Medical School, Philadelphia, Pennsylvania; member of Virginia Medical Society, Richmond Academy of Medicine, Philadelphia Protologic Society, Affiliated American Proctological Society and Journal Club.

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Leo H. Criep, M.D., associate professor of medicine, University of Pittsburg, was a contributor in the February issue of Journal-Lancet.

Theodore H. Aaron, M.D., president of the Montefiori Hospital, New York, New York; graduate of the University of Alberta in 1942; member of the Canadian Society for Study of Allergy, Canadian Medical Association, Edmonton Academy of Medicine, Alberta Medical Association.

Management of the Allergic College Student*

Leo H. Criep, M.D., and Theodore H. Aaron, M.D.
Pittsburgh, Pennsylvania

The early recognition and the adequate therapy of allergic manifestations of all age groups is important and necessary. Diseases of sensitivity, if allowed to carry on unchecked, may lead to multiple sensitivities and to irreversible pathological states.

Vaughan's statement[1] that approximately 10 per cent of the population develops the common major allergies has been accepted as fact. It is, therefore, very important to know at what age these diseases develop. Allergists realize that most allergic persons begin to have symptoms within the first three decades. Bray [2] in England has charted the appearance of allergic symptoms in the different decades. It has been seen that 30 per cent of those with asthma, 50 per cent of those with hay fever, 23 per cent of those with eczema and 25 per cent of those with urticaria first notice symptoms in the second and third decades. These figures illustrate that a great many college students will find themselves at school suffering from a disease which needs adequate attention and with which they are unfamiliar.

There are many factors that influence the onset or abatement of symptoms. Exposure to a new climate with changes in weather, variation in temperature, changes in diet and diet habits; exposure to strongly antigenic substances such as ragweed pollen with which there has been no previous contact, or exposure to high concentrations of dust, fungi and laboratory fumes, all tend to raise the incidence of allergic diseases. Mental tension, menstrual difficulties, fatigue, or loss of sleep may influence and aggravate allergic diseases. There is no doubt that many college students unnecessarily expose themselves to the elements and are often emotionally tense. Under stress and strain all allergic conditions are either precipitated or made worse. A young lady attending one of the eastern finishing schools developed a very severe attack of urticaria just before final examination. She received an invitation to attend the prom at Annapolis. The anxiety of the examination and the worry about the urticaria interfered with her acceptance of the invitation. This helped to make the condition intolerable.

As a rule, the diagnosis of these diseases is fairly easy to make. Of course, as with all diseases, there are exceptions. However, with allergic diseases it is necessary for adequate therapy to determine the exact offender or offenders.

Allergic rhinitis manifests itself with itching of the nasal and eye membranes, sneezing, tearing of the eyes, a watery secretion from the nose, and blockage of the nasal passages. The nasal membranes become swollen and develop a boggy, purplish-red appearance. A smear of the secretions usually shows an abnormally high concentration of eosinophiles. If the manifestations are seasonal, they are usually related to the pollination of the different plants, such as the trees, the grasses and the weeds. It is usually seasonal allergic rhinitis that plays havoc in most parts of the country during the students' most harassing time, for the trees pollinate in spring and the grasses in June. If the manifestations are perennial, the sensitivity may be caused by foods, fungi, bacteria, or such inhalants as dust and animal danders. It is well to remember that allergic rhinitis may eventually be complicated by asthma, nasal polyps, sinus disease, and vernal catarrh. This disease must be differentiated from vasomotor rhinitis and sinusitis.

Asthma is a condition which is dependent upon bronchial obstruction. This obstruction is usually spasmodic and is associated with a prolonged expiratory phase. The allergic reaction causes edema of the bronchial mucous membrane with the production of thick tenacious mucus, and spasm of the bronchial musculature. Asthma is commonly caused at this age by sensitivity to inhalants. There often is, however, the possibility of a food allergy. Bacterial and drug sensitivity must also be thought of as an initiator or aggravator of the disease. A postnasal drip from a chronic sinusitis, dust, strong odors of chemicals in a laboratory may prepare the shock tissue for an attack.

Asthma may be seen to follow a persistent allergic cough, a fever, or be related to a recurring allergic rhinitis. A good history is important as well as a careful physical examination. X-ray and sputum studies are necessary and so are skin tests. Bronchograms and electrocardiograms are rarely needed. The differential diagnosis includes asthmatic bronchitis which is often classified with this disease. Malignancies must be thought of though rarely are see—such as bronchogenic carcinoma, pressing Hodgkin glands and lymphosarcoma. Cardiac asthma also is rare at this age. Tuberculosis and pressing tuberculous tracheobronchial glands, however, must be considered, as well as a substernal goiter, foreign bodies in the bronchii, sighing dyspnea and hysteria. The thymus has usually shrivelled up by this period. Complications to be emphasized are bronchitis, bronchiectasis, bronchopneumonia, atelectasis, and emphysema.

It is most important for all but especially the asthmatic student to feel he is no different from the others. He must also feel he can participate in everything the others do between attacks. However, there must be sensible limitations, especially in competitive sports. Swimming pools are often filled with chlorinated water which is irritating to the sensitive membranes. Drafty gyms and improper care in the dressing room after a strenuous game often lead to an attack. In order to accentuate the feeling that he is the same as the others, the asthmatic follows their carefree ways and is soon seen with another attack. Therefore, it must be emphasized that these people should not be harmed on the one hand by increasing their tension through restriction, but also, on the other hand, they should not be endangered by having no protecting regulations.

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*From the Department of Medicine, Division of Allergy, School of Medicine, University of Pittsburgh, Pittsburgh, Pa.

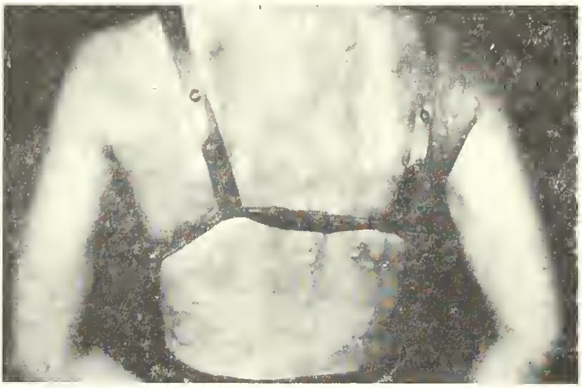

Fig. 1. Severe generalized urticaria in young college girl due to wheat.

Allergic dermatologic conditions of the major type to be considered are urticaria and eczema. Urticaria or angioneurotic edema is manifested by discreet, pruritic swellings of the skin or mucous membrane, varying both in size and time of appearance (Fig. 1). It is often caused by sensitivity to food or drugs. It also may be due to injections or contact agents such as certain caterpillar hairs and pollens. One must not forget the possibility of inhalant sensitivity and the presence of physical allergy. It may be initiated or aggravated by infections and mental tension. Chronic urticaria is a most distressing and difficult disease to treat.

Skin tests, elimination trials, and food diaries may aid in the establishment of a diagnosis. Urticaria must be differentiated from such diagnoses as insect bites, herpes, and the swellings of nephritis or cardiac failure.

Atopic dermatitis, or eczema, may be seen as an exacerbation of an infantile eczema or the beginning of an adult eczema. The characteristic lesion is a papule with oozing and lichenification. The site is usually flexural. The intense itchiness is often accentuated at night. The disease is aggravated by trauma, climate, and emotion. It is commonly related to foods, but can also be due to an inhalant or bacterial sensitivity. Eczema must be differentiated from seborrheic dermatitis, dermophytids, bacterids, dermaphytoses, infectious eczematoid dermatitis, and contact eczema. The danger of the development of chronicity and of infection is always present.

The eczematous contact types of dermatitis is a disease of the epidermis which is manifested chiefly by vesiculation (Fig. 2). It is caused by contact sensitivity to some substance. The most common contact sensitizer is poison ivy. There are many varied substances to which one can become sensitized, such as flowers, animal products, metallic salts, drugs, cosmetics, clothes dyes, and industrial and laboratory chemicals (Fig. 3). Irritants may stimulate or prepare the skin for the development of this dermatitis. The diagnosis is made by contact patch tests of the materials in the proper concentration. As a rule, removal of the antigen will result in the abatement of the disease. Infection and the development of multiple sensitivities may play a part in keeping the eczema chronic. This must be differentiated from atopic eczema, irritant and toxic dermatitis, dermaphytids, bacterids, and seborrheic dermatitis.

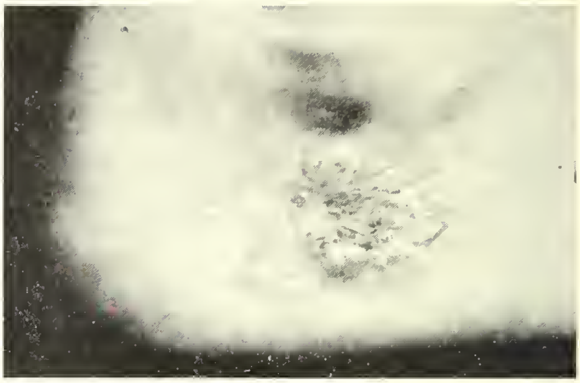

Fig. 2. Poison ivy dermatitis.

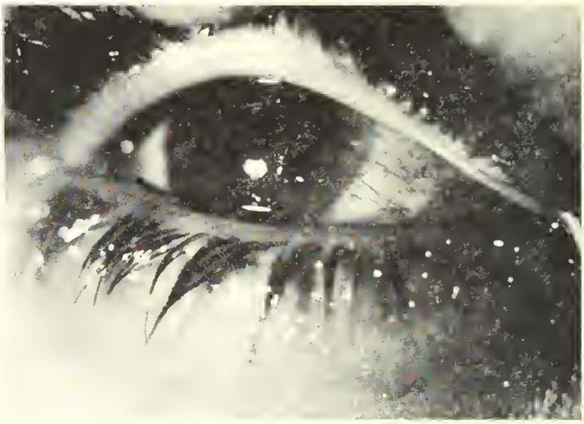

Fig. 3. Dermatitis of eyelids due to nail polish.

There are many other skin diseases which are of allergic etiology that must not be forgotten. Some of these we have mentioned, such as bacterids, dermophytids, and infectious eczematoid dermatoses.

The minor allergies, which are not to be forgotten and may be seen occasionally at this age group, are gastrointestinal allergy, including cases of the so-called mucous colitis, allergic headaches, a small proportion of migraine headaches, and a few cases of allergic neurological and ophthalmic conditions.

In a discussion of allergy in the younger age groups, we must never forget the danger involved in giving immunization injections for the prevention of infectious diseases to sensitive individuals, especially those with allergic backgrounds. The allergic person easily becomes very sensitive to horse serum and egg white which are contained in some of these immunization preparations.

One must always look for these sensitive people and always cautiously perform skin tests prior to injection in the sensitive individual.

When the student is aware that he has something that is abnormal, inconvenient, or which gives him mental anguish, he will attend the dispensary. The student may have already diagnosed the condition because of the frequency of the appearance of allergic diseases, or because these diseases are so often familiar.

The problem of a complete provision for early diagnosis and treatment should be carefully handled. Generally speaking, it is through careful management that the allergic disease will have the opportunity to become quiescent, and the chance of the development of permanent pathology and complications will become less probable in these young people. The college dispensary should be on the alert to recognize these diseases and the advantages of adequate early care.

There are many courses which may be followed. If the student comes from a local family, it is most wise to refer the patient to the family physician with a suggestion as to the need of allergic care.

If the student is away from home, referral may be made to the allergy clinic connected with the college school of medicine. Here the student may have all the advantages of the department. During the vacation period, therapy, if necessary, may be taken over at home by the student's family physician. The student who is suffering from an allergic disease and has come to school may have his family physician send in his prescribed wishes. These can be carried out by the dispensary, by a local physician, by a local allergist; or the student can be managed by the college allergy clinic. If there is no clinic attached to the school, the dispensary may arrange to refer their cases to one or more recognized allergists in the city. Also, students who would rather be attended privately should be referred to a local physician, preferably one who is in charge of the school allergy clinic. In every case, whenever possible, it is best to give a summary of the findings and treatment to the family physician and to allow him to carry on the therapy.

The school health official has a rare opportunity for performing a creditable medical job by recognizing early, and being instrumental in treating adequately, allergic conditions in the young.

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AMERICAN STUDENT HEALTH NEWS

The State College of Washington, Pullman, Washington, announces that Dr. James E. Goodnight, a native of Abilene, Texas, has been selected as the Director of Student Health. Other members of the staff of the Health Service are Drs. Troy M. Price of Seattle, Washington, and Landon H. Gurnee of New York and Spokane, Washington.

Due to the recent sudden death of Dr. Bolton, the University of New Hampshire at Durham, New Hampshire, is looking for a director of the University health service. Contact Dean Everett B. Sackett for information.

The University of Wyoming, Laramie, Wyoming, has recently appointed Dr. William Nesbitt as director of the Student Health Service.

The Secretary requests that any changes in medical staff, which have been made since the questionnaire was sent out last year, be reported to his office.

To the Editors:

May I extend my congratulations to you on the excellent manner in which my article on Streptomycin has been presented in the July issue of Journal-Lancet, a copy of which I have just received. The illustrations have been particularly well done, I find no errors of any sort in the article, and the general composition of the article is very pleasing. The editorial staff of the Journal is to be complimented on the technically outstanding accomplishment.

William B. Tucker, M.D.,
Chief, Tuberculosis Service,
Veterans Administration Hospital

The
JOURNAL
LANCET

Official Journal of the

American Student Health Association
Great Northern Railway Surgeons' Association
Minneapolis Academy of Medicine
North Dakota State Medical Association
Northwestern Pediatric Society
Sioux Valley Medical Association
South Dakota Public Health Association
North Dakota Soc. of Obstetrics and Gynecology

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...NEWS ITEMS...

NORTH DAKOTA

Dr. W. F. Potter of Oxford, Mississippi, has accepted the position as dean of the University school of medicine.

Dr. Potter, who has been head of the department of physiology and paracology at the University of Mississippi for the past 12 years, will succeed Dr. Alfred H. Lawton, who resigned after one year in the deanship here to accept a position with the Veterans Administration in Washington.

In addition to serving as dean, Dr. Potter will be professor of physiology and pharmacology here and also will succeed Dr. Lawton as head of that department.

Appointment of the new dean fills all major positions in the school of medicine for this fall, Dr. West said. Department heads, in addition to Dr. Potter, are Dean Emeritus H. E. French, gross anatomy; Dr. Robert R. Kling, microscopic anatomy; Dr. Arthur K. Saiki, pathology; and Dr. Richard M. Marwin, who is coming from the University of Minnesota to head the department of bacteriology.

The fifth annual meeting of the North Dakota Public Health association will be held here Oct. 28 and 29.

Dr. Irvine McQuarrie of the University of Minnesota and Dr. Russell O. Saxvik of Bismarck, state health officer, will speak at a meeting of the Health Officers association Oct. 28.

On Oct. 29 sectional meetings will be held. A banquet will be held Oct. 28.

Dr. G. Wilson Hunter, obstetrician and gynecologist at the Fargo clinic, was advanced to the rank of Fellow in the International College of Surgeons at a Chicago meeting of the executive council of the United States chapter.

Dr. Hunter's degree will be conferred at the next annual assembly in St. Louis, Nov. 19.

Dr. Hunter, who also is a Fellow in the American College of Surgeons and a Diplomate of the American Board of Obstetrics and Gynecology, was inducted as a member of the International College of Surgeons in 1944. He recently returned from an international meeting at Rome, Italy.

The Grand Forks clinic has moved its offices and equipment to its new building at 221 S. Fourth st., across from Deaconess hospital, according to W. L. Nelson, manager.

Dr. John (Jack) Burton, son of Dr. and Mrs. Paul H. Burton joined the staff of the Dakota clinic in Fargo as a specialist in urology.

A native Fargoan, Dr. John Burton was graduated from Fargo high and received his degree in medicine from the University of Minnesota. He was a resident physician in a New Orleans hospital when he entered service Aug. 1, 1942, later serving overseas. He was discharged from service in 1945.

Dr. Donald Sterns, a University graduate, recently became associated with Dr. T. Q. Benson in his office at 323½ DeMers Ave. Dr. Sterns graduated from the University with a B.A. and B.S. degree in 1944, and received his M.D. degree from Baylor university in 1945. He interned in Newark, New Jersey and served two years in the armed forces during the war.

Two additions to the Fargo clinic have been announced.

Dr. R. B. Tudor is a member of the pediatrics department with Drs. L. G. Pray and M. H. Poindexter.

Dr. L. E. Wold has joined the department of internal medicine.

Dr. Tudor was graduated from the University of Minnesota. He interned in Minneapolis and served as an attending physician at the Minneapolis General hospital. Prior to entering the army in 1941, he was in general practice in Hibbing, Minn.

After being discharged, Dr. Tudor commenced his pediatric training at Duke university. He has been at Johns Hopkins hospital in Baltimore where he completed his residency.

Dr. Wold, who grew up in Cando, N. D., was graduated from the University of North Dakota in 1935. He attended Rush Medical college, receiving his M.D. in 1938. He interned at Ancker hospital, St. Paul, and began practice in Wisconsin. In 1942 he received a fellowship in internal medicine at Mayo clinic, Rochester, Minn.

During the war, he served with the First army. After spending 26 months overseas, he returned to complete his 3-year fellowship.

With 25 specialists in internal medicine from North Dakota and Winnipeg attending, a North Dakota regional meeting of the American College of Physicians opened September 11 in Fargo. Dr. A. C. Fortney of the Fargo clinic, was general chairman.

The opening session was at 10 a.m. at the Fargo clinic. Dr. Robert B. Radl, Bismarck, governor for North Dakota, presided. Speakers were Dr. F. T. Lytle, Fargo; Dr. L. H. Fredricks, Bismarck; and Dr. A. C. Grorud, Bismarck.

At the afternoon session, speakers were Dr. Allen E. Moe, Fargo; Dr. Fortney; Dr. William A. Stafne, Fargo; Dr. William S. Middleton, dean of the University of Wisconsin medical school at Madison; Dr. C. H. Peters, Bismarck; Dr. W. E. G. Lancaster, Fargo, and Dr. R. O. Goehl, Grand Forks.

A 6:30 dinner in the Gardner hotel was scheduled. Dr. Middleton was banquet speaker.

Attending from Winnipeg were Dr. J. W. MacLeod and Mrs. MacLeod, also a physician; and Dr. C. H. A. Walton.

Dr. Edward A. Jones, who has been associated with the Lake Region Clinic in Devils Lake since January, has been notified of his appointment to a post graduate course leading to a masters degree in orthopedic surgery at the University of Liverpool in England.

He sailed from Montreal for England September 25 and will study at the University of Liverpool for 18 months.

A survey of present facilities and future needs of the Grand Forks Deaconess hospital is now under way, hospital officials have announced.

A study of services rendered the community by the hospital during the past few years is being made by the firm of Charles A. Haney and Associates of Boston, Mass., who have established temporary offices in the auditorium of the Deaconess hospital nurses' home.

Upon completion of the survey, it is expected that the firm's report will be used as a basis of an extensive financial campaign to enlarge the institution, chartered as a non-profit corporation, hospital officials added.

Dr. Haney has been active as a hospital consultant and fund-raising counsel for 25 years and during that time, has directed building fund campaigns for hospitals all over the nation.

The hospital consultant comes to Grand Forks from North Conway, N. H., where he has just completed a successful $233,000 building fund campaign to enlarge the hospital there. Other recent campaigns conducted by Dr. Haney include one for Bath Memorial hospital, Bath, N. Y.; Huggins Memorial hospital, Wolfeboro, N. H.; and one for the South Florida Children's hospital in Miami.

Affiliated with Dr. Haney in the Grand Forks survey are his brother, William A. Haney, and his son, William R. Haney.

Dr. O. R. Saxvik, state health officer, has announced that North Dakota's allotment of federal funds for hospital construction in this fiscal year has been reduced by about $20,000.

The state's original allotment of $308,325 has been cut to $287,845, Saxvik was advised by the U. S. public health service.

Reason for the cut was that minimum state allotments have been increased to $100,000 and that amounts received by various states are now based on new population figures, he added.

Saxvik said that the reduction may not materially affect North Dakota's hospital building program this year. To date only the Garrison hospital has been approved for construction by the state health council and will receive some federal money.

The Jamestown clinic announces the association of Dr. George V. H. Kleifgen with the clinic.

Dr. Kleifgen was a resident of St. Paul, Minn., and received his early education there. He attended the University of Minnesota where he received his Bachelor of Science degree and later the degrees of Bachelor of Medicine and Doctor of Medicine from the Minnesota Medical school.

Dr. Kleifgen completed a year of internship at St. Joseph's hospital, St. Paul, at which time he was awarded a fellowship in general surgery at the Mayo Clinic from 1943 to 1947. Dr. Kleifgen comes well recommended, the clinic announces.

His particular work with the clinic is surgical diagnosis and surgery.

Dr. R. H. Breslin, Mandan, has received notification of his appointment by the North Dakota Medical association, meeting recently in convention as chairman of the committee on mental hygiene for the state of North Dakota.

In the capacity of chairman of this committee Dr. Breslin will work with superintendents of such state institutions as Dr. A. M. Fisher of the Hospital for the Mentally Ill, Jamestown and Dr. J. G. Lamont of the School for the Feebleminded, Grafton.

Included also in the information was the appointment of Dr. Breslin as civilian advisor to the North Dakota Veteran's administration with respect to the treatment of nervous and mental ailments of veterans and the assistance to the veteran's administration in rating veterans pensions for disability in regard to such ailments. Dr. Breslin will be especially concerned with the western portion of the state in connection with this appointment.

Three appointments to the state board of medical examiners were announced August 10 by Gov. Fred G. Aandahl. They are:

Dr. O. W. Johnson, Rugby; Dr. O. A. Sedlak, Fargo; and Dr. R. B. Radl, Bismarck. Johnson and Sedlak were reappointed. Radl succeeds Dr. W. H. Long, Fargo.

Terms are for three years, expiring July 31, 1951.

Allocation of federal funds to the states for mental health activities has been announced by Oscar R. Ewing, federal security administrator.

The money, authorized by the national mental health act, is distributed on a basis of two federal dollars for each dollar put up by the state. The amount is based on population, financial need and extent of the mental health problem.

The purpose is to help finance a program of research, training of personnel and development of local mental health facilities.

Grants to the states include: North Dakota $20,000; Minnesota, $68,000; Montana, $20,000; South Dakota, $20,000.

Dr. Christ R. Dukart has moved his office from Richardton to the Dickinson Clinic at Dickinson, as of August 2nd.

Dr. Dukart, a native of Stark county, attended Dickinson grade and high schools. He received his Bachelor of Science degree in Medicine from Creighton University, Omaha, Neb., and interned at Clarkson Memorial Hospital, Omaha, and at St. John's Hospital at Fargo.

He did his post graduate work in obstetrics and gynecology in 1937, and post work in cardiology and internal medicine in 1947, at Cook County Post Graduate School of Medicine, Chicago.

SOUTH DAKOTA

A score of medical men recognized for their knowledge of malignancies spoke at a cancer symposium at the Sioux Falls Coliseum Oct. 11-13.

The symposium was sponsored by the American Cancer Society and the state board of health.

The two evening meetings of the scientific discussions were open to the public. On Oct. 11, speakers were Dr. Cornelius P. Rhoades, New York, on "future outlook of Cancer," and Dr. Elbert DeCoursey, Ft. Sam Houston, Texas, "the destructive effects of radiation."

The second evening included discussions by Dr. William C. White, New York, on "Tumors of the breast."

The University of South Dakota School of Medicine has appointed to the faculty eight men who hold the doctor of medicine degree and two who hold the doctor of philosophy degree.

Registration in the School of Medicine commenced September 6, according to Dr. Donald Slaughter, dean, when the new faculty members started their duties. New medical school faculty members include Robert H. King, Ph.D., Purdue university, 1948, assistant professor of biochemistry; Harold N. Carlisle, Ph.D., Ohio, 1948, assistant professor of microbiology; Jacob Belogorski, M.D., Prague, 1942, assistant professor of pharmacology; Kenneth R. Berquist, M.A., South Dakota, 1948, instructor in microbiology; James Y. Clarke, M.D., Minnesota, 1941, assistant professor of clinical pathology and parasitology; Thomas E. Eyres, M.D., Iowa, 1932, professor of public health and director of student health; Theodore Mazur, M.D., Harvard Medical school, 1945, associate in anatomy; Clark Y. Gunderson, LL.B., South Dakota, 1932, lecturer on medical ethics and forensic medicine.

Brooks Ranney, M.D., Northwestern Medical school, 1941, clinical assistant professor of obstetrics and gynecology; Theodore H. Sattler, M.D., Northwestern Medical school, 1942, clinical assistant professor of medicine; David J. Tschetter, M.D., University of Chicago, 1936, clinical associate professor of radiology; Francis C. Tucker, M.D., Harvard, 1941, research assistant professor of oncology, and Cornelia Van Natten, instructor in library methods.

Dean Slaughter also announced the promotion of two members of the medical school staff. He said that Dr. E. M. Stansbury will become clinical associate professor of obstetrics and gynecology, and that Dr. H. F. Hansen will become clinical associate professor of physical diagnosis.

Announcement was made that Dr. Theodore H. Sattler, specialist in diagnosis and internal medicine, opened practice here on August 1, being associated with Drs. F. J. Abts, Chester B. McVay and Robert F. Livingston in the Yankton Clinic at Fourth and Park Streets.

Dr. Sattler attended the Yankton public schools and was graduated from Yankton College with the class of 1937. He attended the University of South Dakota Medical School from 1938 to 1940, and received his medical degree from the Northwestern University School of Medicine at Chicago in 1942.

He served a rotating internship at the Evanston General Hospital, Evanston, Illinois, in 1942 and 1943, following which he served three years as a medical officer in the Medical Corps of the United States Army.

Dr. Sattler received his Master of Science degree from the Northwestern University School of Medicine this year, and comes to Yankton after completing at Wesley Memorial Hospital, Chicago, the three year medical residency requirement for certification by the American Board of Internal Medicine.

Dr. J. V. Carroll has a partner arriving in a not too distant future. He is Lt. Edward J. McNulty, physician and surgeon. At the present time Dr. McNulty, a navy medical officer, is stationed at Springfield, Missouri, and is chief of medical service in a federal hospital at that city. Dr. McNulty received his degree at St. Louis University, and interned at St. Joseph's hospital in Denver, Colorado.

Dr. McNulty comes here highly recommended, and Tyndall is very fortunate to have another doctor. Dr. Carroll and Dr. McNulty will form a partnership and open a clinic here at Tyndall.

Appointment of Wayne F. Cameron, M.D., as surgical resident of the Rapid City Medical Center was anannounced by Dr. F. R. Williams, chief of surgery.

Dr. Cameron received his B.A. degree from Stanford and M.D. degree from Northwestern. One year internship was taken at Evanston hospital in Evanston followed by a three months residency in surgery at the same hospital.

After his release from four years service in the medical corps of the U. S. army with the rank of major, Dr. Cameron served as research Fellow and Surgical Fellow at Northwestern university and as surgical resident at Passavant hospital in Chicago.

Dr. Eugene H. Grove, who has served Arlington community for 44 years, has been nominated by the third district, South Dakota State Medical society, as its choice for "doctor of the year" honors, according to Dr. C. M. Kerschner, Brookings, secretary.

Dr. H. E. Foster, Lyons, N. J., has arrived at Fort Meade to take up his new duties as manager of the veterans administration hospital at Sturgis.

Dr. Foster, who had been manager of the VA hospital at Lyons for the past three years, succeeds Dr. Claude E. Lewis who has been transferred to the VA hospital at St. Cloud, Minn., where he will be manager.

MINNESOTA

Dr. E. J. Huenekens, chairman of Minneapolis' emergency polio committee during the 1946 Minnesota epidemic, was named as chief of staff at Sister Elizabeth Kenny institute. Dr. Miland E. Knapp was appointed chief of physical medicine in charge of treatment.

Dr. John F. Pohl will be consulting orthopedic surgeon.

At the 28th annual meeting of the Northern Minnesota Medical association, the association announced the election of Dr. R. H. Puumala, Cloquet, as its president, succeeding Dr. Charles W. Vandersluis, Bemidji; Dr. Wilford J. Deweese, Bemidji, vice president and Dr. C. L. Oppegard, Crookston, re-elected secretary-treasurer. The 1949 meeting place will be Alexandria.

Minnesota health officials, scheduling a series of six health days designed to spur formation of community health councils, have chosen Duluth for a conference Oct. 15. The session will cover St. Louis, Cook, Lake, Pine and Carlton counties. The Associated Press reported in St. Paul last night that Bemidji will play host Oct. 25 for Koochiching, Clearwater, Beltrami, Hubbard, Cass and Itasca counties.

The American Medical Association Council on Medical Education and Hospitals has approved the University of Minnesota's course in occupational therapy.

On September 9, 1948, Dr. Vernon L. Hart of Minneapolis left New York for the American Occupied Zone in Germany where he will take part in a teaching program in the various American hospitals for a period of about six weeks. During this time Dr. Hart will serve as a civilian consultant for the Office of the Surgeon General.

Dr. Olaf Mickelsen, associate professor in the University of Minnesota's laboratory of physiological hygiene, has resigned his position to become chief of the biochemical section in the United States Public Health service nutrition division in Washington, D. C., Dr. Mickelsen has been on the staff of the University of Minnesota since 1940. He will begin his new duties in Washington at once.

Doctor Philip K. Arzt of St. Paul, Minnesota, Assistant Clinical Professor of Neuropsychiatry at the University of Minnesota, has recently been appointed Senior Consultant in Electroencephalography at the University of Minnesota Medical School.

On June 9, 1948, the degree of Doctor of Science (Ophthalmology) was conferred upon Dr. Bourne Jerome by the University of Pennsylvania for graduate work carried on there before and after service in the recent war. Dr. Jerome received his M.D. degree from the University of Minnesota in 1935. He is associated with Dr. Karl E. Sandt and Dr. W. J. Bushard in the practice of Opthalmology in Minneapolis.

Dr. Abraham Shedlov, Fosston, Minnesota, has retired after 28 years of practice. His practice will be taken over by Dr. Hartvig Roholt of Waverly, Minn.

Among the speakers at the Fall Clinical conference of the Wells County Medical society at Bluffton, Indiana, Sept. 15, were Dr. J. Arnold Bargen of Rochester and Dr. Hamlin Mattson of Minneapolis. Dr. Bargen spoke on "The Present Day Management of Intestinal Obstruction" and Dr. Mattson on "The Use of the Superior Pubic Ligament in Inguinal Hernia Repair." Dr. Fred L. Adair, emeritus professor of obstetrics and gynecology of the University of Chicago, spoke on "Toxemias of Pregnancy."

Deaths

Dr. Charles F. Wisner, 90, pioneer physician of Grand Forks, North Dakota, died August 7.

Dr. John F. McKie, 66, Sturgis, South Dakota, died September 2.

Dr. Charles T. Schroyer, 71, who practiced 34 years in the Sioux Falls area, died July 15.

Dr. Byron E. Crawford, 75, who practiced for 20 years in Chamberlain, South Dakota, died August 23.

Dr. Olin A. Kimble, 70, Mundo, South Dakota, died August 24.

Dr. H. B. Allen, 42, chief physician for the Hormel Company, Austin, Minnesota, died August 24, in California.

Dr. A. A. Passer, 68, pioneer physician of Olivia, Minnesota, died August 18.

Dr. J. T. Schlesslman, 71, retired Mankato, Minnesota physician, died September 6.

Dr. Ludwig R. Lima, 71, Montivideo, Minnesota, died September 4.

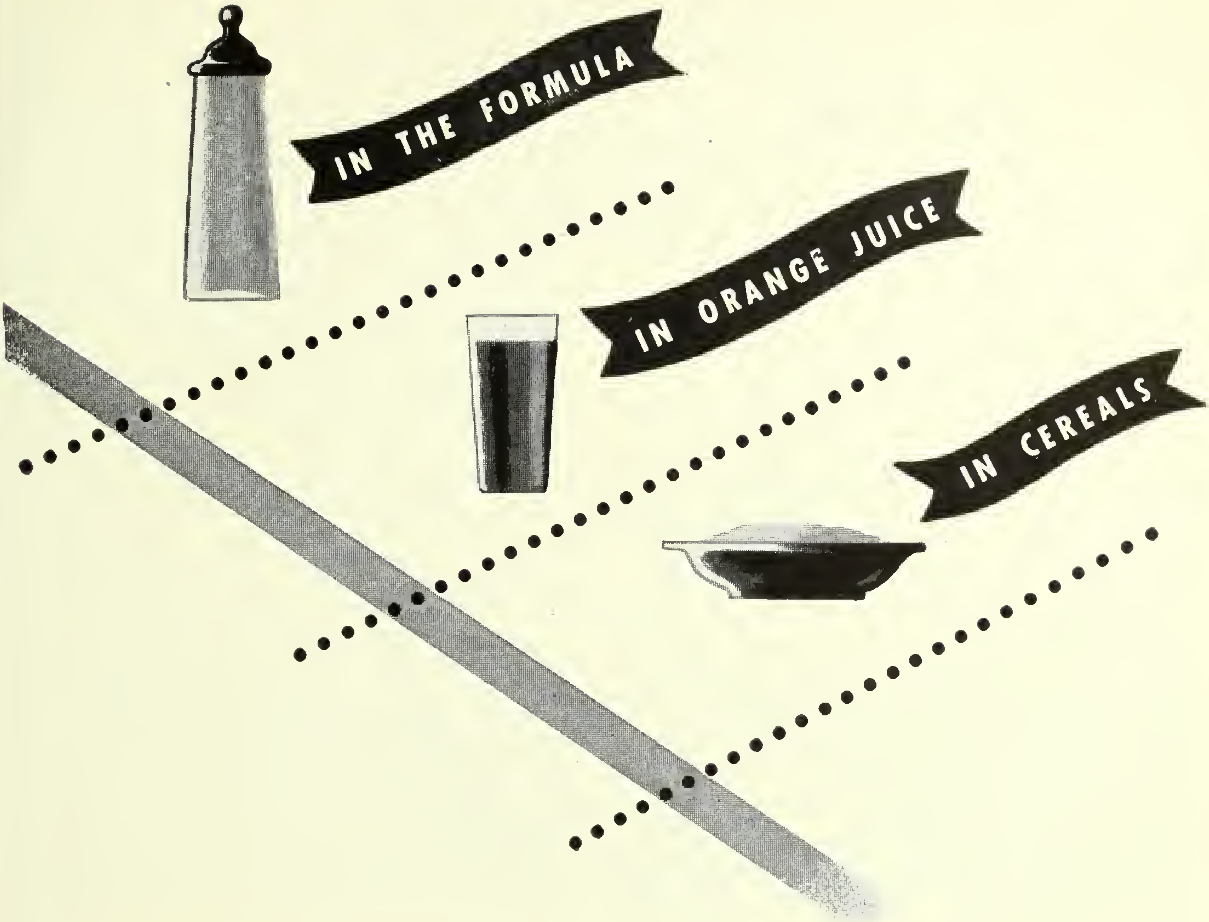
Dr. Jennings C. Litzenberg, 78, of Minneapolis, Minnesota, died August 15. He was professor emeritus and former head of the University of Minnesota department of obstetrics and gynecology.

Dr. L. E. Claydon, 79, Red Wing, Minnesota, died August 15.

Dr. Melvin A. Wogtel, 56, Minneapolis, Minnesota, died August 30.

Dr. Theodore Holtar, 65, Waterville, Minnesota, died August 22.

Dr. William Reed, 82, of Deerwood, Minnesota, died September 9.



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Book Reviews

A Primer of Cardiology, edited by GEORGE E. BURCH, M.D., F.A.C.P., and PAUL REASER, M.D. Philadelphia: Lea and Febiger, 1947, 257 pages, $4.50. **Unipolar Lead Electrocardiography,** edited by EMANUEL GOLDBERGER, B.S., M.D. Philadelphia: Lea and Febiger, 1947, 182 pages, $4.00.

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These two latest volumes published by Lea and Febiger in the field of cardiology are directed at opposite ends of the medical education spectrum: the primer is written for the sophomore and junior medical student; Goldberger's monograph by its highly specialized nature is addressed principally to internists and cardiologists.

Emanuel Goldberger of Columbia University has been a prolific contributor to electrocardiologic literature for the last six years. He has developed his own modification of the Wilson unipolar lead, the Goldberger augmented unipolar lead. Goldberger's method has become so popular that a number of instrument companies have marketed attachments for their electrocardiographs incorporating the Goldberger lead.

The present work is a slim volume of 182 pages representing the current knowledge of unipolar leads. Goldberger is a facile writer with a flair for accurate observation and literary description. In a recondite field his work is a model of clarity and simplicity. The early chapters are concerned with the development of the unipolar lead from the standpoint of electrical physics and muscle physiology. From these fundamental concepts he proceeds to the normal unipolar leads always referring to the comparable bipolar leads. The second section is devoted to abnormal electrocardiographic patterns especially various types of hypertrophy and variations in axes, bundle branch block, and myocardial infarcts. Such subjects as arrythmias to which unipolar electrocardiography adds little are largely omitted. This book is not recommended as an introduction to the science of electrocardiography. This reviewer considers the book a necessary part of the library of everyone reading electrocardiograms.

Burch and Reaser's "Primer" seems to be designed from lecture notes for sophomore and junior students of physical diagnosis. Covering a large field, it is necessarily brief and dogmatic. Its usefulness will depend upon the number of teachers of physical diagnosis of heart disease in medical schools who see fit to recommend this work to their students. Its brevity recommends it for use as a review in preparation for board examinations. There are a number of minor errors that detract from the value of the book as a teaching adjunct. The right second interspace is given as the PMI for aortic murmurs. This is the classical point but recent work has demonstrated that most aortic murmurs are best heard to the left of the sternum. Seventeen dependable or pathognomonic signs of organic heart disease are listed. Several of these such as "severe anemia," "myxedema" and "thyrotoxicosis of several months' duration" are at least questionable.

The work is profusely and well illustrated. The material is artistically presented and no doubt will stimulate undergraduate students to probe deeper into the interesting field of cardiac abnormal anatomy and physiology. R.B.

Practical Office Gynecology, by KARL J. KARNAKY, M.D. Springfield, Illinois: Charles C. Thomas Co., 1948, 224 pp., illustr., $7.50.

– – – – – – –

This book, as the title indicates, concerns the care of gynecological problems encountered and treatable in office practice. Generative tract disease of a major nature is little more than mentioned to point out the necessity for diagnosis.

The content deals majorily with therapy of abnormal uterine bleeding due to non-malignant causes, and the therapy of inflammatory lesions of the vagina and cervix. The avoidance of radical surgery for functional uterine bleeding disturbances has been well pointed out, however, at the expense of an inordinate emphasis upon the use of large doses of stilbestrol for most of the abnormal uterine bleeding not due to malignancy.

The illustrations and photographs are excellently reproduced.

There is an astonishing variety of diseases treated with stilbestrol. T.B.

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PREPARATION OF MANUSCRIPTS

JOURNAL-LANCET extends an invitation to the profession for articles with the understanding that they are original contributions not previously published.

Manuscripts are to be typed on one side of the paper with double spacing. Illustrations must be in the form of glossy prints or drawings in black ink. Please do not attach legends to the pictures. A reasonable number (two or three) illustrations are published free of cost; special arrangements must be made for excess or highly finished illustrations or tables.

Bibliographic references should be at the end of the manuscript and not in footnotes. Each reference should include the following information in the order indicated: Name of author with initials; title of article; name of periodical; volume, page and year. Reprints are prepared on order.

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The JOURNAL LANCET

Minneapolis, Minnesota
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New Series

The Diagnosis and Treatment of Certain Congenital Cardiac Defects Amenable to Surgery

K. Alvin Merendino, M.D.
Minneapolis, Minnesota

INTRODUCTION

Ten years ago, congenital defects of the heart joined the ranks of reversible heart disease, when Gross of Boston successfully ligated a patent ductus arteriosus. At the present time, the division and ligation of the patent ductus arteriosus is a well accepted and curative therapeutic procedure. More recently, in 1945, Blalock and Taussig of Baltimore brought forth a new operative procedure for the relief of patients with the Tetralogy of Fallot. In 1945, Crafoord of Sweden and Gross of Boston, working independently, reported the successful excision and anastomosis of the aorta for coarctation. Thus, two additional serious congenital cardiac defects have yielded to surgical therapeusis.

The courageous approach of these surgeons to the problem of congenital heart disease previously considered hopeless, has stimulated the imagination and interest of a large group of doctors and scientists. The internists and pediatricians are recalling and re-evaluating such patients seen in the past. There is a new awareness of the fact that to establish the diagnosis of congenital heart disease is not enough. An accurate diagnosis is essential in order to determine the practicability of the surgical approach. A tremendous effort is being exerted by our colleagues in the ancillary divisions of clinical medicine with particular reference to the measurement and variations of the mechanisms involved. Surgeons are extending their research projects, in an attempt to devise operations applicable to other cardiac defects, both congenital and acquired. The net result will mean a tremendous increase in the sum total of our knowledge in the field of cardiac diseases.

The markedly increased volume of published articles with reference to these problems reflects the interest which already has been aroused.

INCIDENCE

In an analysis of the autopsy series at the University of Minnesota Hospitals, Dr. Clawson of the Department of Pathology has found that the incidence of congenital heart disease in all autopsies including stillbirths is eight per thousand; more than 10 per cent of these autopsied cases were stillbirths. The incidence of the major congenital defects amenable to surgery was as follows: Tetralogy of Fallot, 5 per cent; patent ductus arteriosus, 3 per cent; coarctation of the adult type, 5 per cent.

One is unable to gather accurate statistics of the number of living patients with congenital cardiac defects amenable to surgery. A rough computation reveals that in any given year in the United States alone, the number of children who are born with these defects and who will be potential surgical candidates, far exceeds the total number of cases treated surgically up to the present time in the entire world. In addition, only a most minute inroad has been made into the back-log of the living cases born prior to the year 1945.

It is apparent that the number of centers where such work can be done must be increased in order to meet the needs of our national and international community.

Diagnosis

In order that these three congenital cardiac anomalies may be referred to the proper depot centers where such work is being undertaken, it is necessary that the practicing medical men be refamiliarized with the signs and symptoms of these disorders.

The first step involves the establishment of the presence of congenital heart disease.

The diagnosis of congenital heart disease is based on the following criteria:

1. History of heart disease from birth or early childhood.
2. In some cases the characteristic cyanosis and clubbing of the fingers. (The great majority of these patients have no cyanosis or clubbing of the fingers.)
3. Murmur in the heart of a bizarre nature, usually harsh and prolonged and usually transmitted better than murmurs due to valvular disease. It is not uncommon to hear such murmurs down the humerii, along the spinal column and even on top of the head.
4. In many cases a marked thrill is palpable.
5. Characteristic x-ray configuration of the heart.
6. Electrocardiographic changes which corroborate clinical and x-ray findings.

In most instances except the very severe, these patients first come under the observation of the physician when they reach the school age. Often a heart murmur has been found during the school physical examination. Too often the parents of these children have been told by their family physician or pediatrician that the child "would outgrow the condition." It is for these reasons that a distinction of the various aspects of the diagnosis of certain congenital hearts, which can be surgically treated, is timely and important. Having once established the presence of a congenital heart, one is then faced with the responsibility of differentiating the various types.

Maude Abbott[1] has classified the congenital heart diseases as follows:

A. Non-cyanotic.

- I. Acyanotic (No abnormal circulation exists, therefore no reason for cyanosis)
  Example: 1. Coarctation of aorta.
- II. Cyanose tardive (Abnormal communication exists between arterial and venous circulation; cyanosis occurs only if pressure in the right heart becomes greater than that in the left causing a venous-arterial shunt)
  Example: 2. Patent interventricular septum.
  3. Patent interauricular septum.
  4. Patent ductus arteriosus.

B. Cyanotic (Permanent cyanosis caused by direct admixture of venous and arterial blood through a venous-arterial shunt).

Example: 5. Tetrad of Fallot (Pulmonary stenosis, patent interventricular septum, dextroposed aorta receiving blood from both ventricles and enlargement of right heart).

Patent Ductus Arteriosus

In utero, the ductus arteriosus is a vessel of considerable size which acts as a by-pass directing the blood from the pulmonary artery away from the fetal lungs into the aorta. This situation arises because of the increased peripheral pressure in the lung bed distal to the patent ductus arteriosus. This increased peripheral pulmonary pressure is due to the fact that in utero the lungs are unaerated. In the normal new born, the ductus closes shortly after the first breath is taken. If this sequence of events does not take place, a patent ductus arteriosus persists. The closure may occur up to one year of age. Consequently, one would not advise surgical closure before this time except for the premature appearance of symptoms which endanger the patient's life. It is obvious that whereas in utero the blood is shunted from the pulmonary artery into the aorta, following aeration of the lungs after birth, the peripheral resistance is lowered and the pressure within the pulmonary artery falls. Therefore, if this shunt remains open, a reversal of the blood flow takes place from the aorta which contains a high pressure into the pulmonary artery, which carries a lower pressure. The pathological physiology present results in changes which when understood helps establish the diagnosis.

As a result of this arterio-venous shunt, the pulmonary artery receives blood both from the right ventricle and the left ventricle through the aorta, and as a consequence the pulmonary artery enlarges. The lungs receive not only the normal amount of blood from the right ventricle but, in addition, the shunted blood from the aorta. After passing through the lungs, the left auricle receives this increased volume of blood and becomes enlarged. With the rapid falling away of the aortic blood through this shunt during diastole, the diastolic pressure is reduced resulting in an increased pulse pressure. The left ventricle must do an additional amount of work paralleling the increased amount of blood entering the left auricle thence to the left ventricle, plus the additional compensation which must be made to overcome the blood lost through the shunt which would normally be carried to the periphery. As a crude example, if 100 units of blood were normally pumped out of the left ventricle to the periphery, and 50 units were shunted through the patent ductus, the left ventricle then would have to pump 150 units of blood to compensate for this loss.

The right ventricle normally empties its chamber against the normal peripheral pulmonary resistance. However, because of the shunt, this blood mass must be ejected against the increased pressure in the pulmonary artery. Therefore, right ventricular hypertrophy may result.

Two types of patency of the ductus occur. The duct may remain open as a part of a serious developmental defect and may be the only means of carrying on the circulation in a heart seriously impaired by other congenital defects. This type of lesion cannot be treated surgically or in any other way. In the type of case which is curable by surgery, the patent ductus is usually the only important defect present. The heart is otherwise normally developed. Strictly speaking, the uncomplicated isolated patency of the ductus is not a congenital lesion as it occurs after birth and has nothing to do with the defects of the heart.

These patients are never cyanotic. Stunting of growth occurs in approximately 50 per cent of the patients. This retardation of growth may result from the shunting of blood from the peripheral circulation into the pulmonary circulation. No correlation studies have been made with regard to the size of the shunt in relationship to the stunting of growth. The most characteristic finding in this lesion is the so-called machinery murmur which is commonly heard over the first or second interspace just to the left of the sternum. This murmur is pathognomonic, and once heard is easily recognized. The murmur is continuous throughout the heart cycle.

The clinical diagnosis of patent ductus arteriosus usually cannot be made unless this characteristic machinery murmur is present. A thrill, palpable over the point of maximum intensity of the murmur, is usually but not always present. The peripheral vascular findings will vary dependent upon the size of the ductus. In patients in whom the ductus is small, the pulse pressure may be normal. However, in those individuals in whom there is any considerable leak through the open ductus, the peripheral findings will be much the same as those found in aortic regurgitation—that is, increased pulse pressure, pistol shot femorals, capillary pulse, etc. The electrocardiogram in patent ductus arteriosus is important from a negative point of view. In the uncomplicated lesion the electrocardiogram is invariably within normal limits. Occasionally there may be a slight right or left axis deviation. However, if the deviation is marked the diagnosis should be seriously questioned.

The abnormality of the movement and disposition of the blood suggests certain signs which should be sought for in the x-ray examination. They include the following:

1. The increased output of left ventricle indicates the possibility of enlargement of this chamber.
2. Since the pulmonary artery receives blood from both the right ventricle and the aorta through the patent ductus, the silhouette of this enlarged artery is found to be the most frequent x-ray sign of patent ductus arteriosus. Sometimes this enlargement can be better appreciated in a right anterior oblique protection which casts into relief the true pulmonary conus.
3. Exaggerated beat of the left ventricle and the pulmonary artery.
4. "Hilar dance" or pulsating hilar vessels. This is present in approximately two-thirds of the cases and is due to the exaggerated systolic expansion of the large vessels in the hila of the lungs.
5. An enlarged left auricle. If the normal mitral valve is not opened wide enough to transmit the large amount of blood being returned to the left auricle through the shunt, enlargement may result. A dilated left auricle is one of the most common signs of patent ductus arteriosus. If one is uncertain as to its presence, a swallow of barium suspension will be of help.

Not every patient will exhibit all of these signs, but one or more of them are shown in each case. A combination of several of these abnormalities should make one suspicious of the diagnosis.

TETRALOGY OF FALLOT

The Tetralogy of Fallot consists of the following defects: (1) pulmonary stenosis, (2) dextroposition of the aorta, (3) interventricular septal defect, (4) right ventricular hypertrophy.

The primary defects are the pulmonic stenosis, the dextroposition of the aorta, and the patent interventricular septum. The right ventricular hypertrophy is a secondary phenomenon. As a result of the pulmonary stenosis there is an abnormally reduced blood flow through the pulmonary artery for aeration. The dextroposition of the aorta indicates that the aorta partly overrides the right ventricle. When this occurs, the aortic septum cannot meet the interventricular septum. Consequently, there is a high ventricular defect. The overriding aorta is just above the septal defect and the blood from the right ventricle being unable to pass through the narrowed pulmonary orifice in its normal volume is directed through the septal defect into the aorta and peripheral circulation, thereby by-passing the lungs and entering the peripheral circulation as unoxygenated or venous blood. The right ventricle in order to empty its chamber must push against the pulmonary stenosis and the higher pressure of the left ventricle which is transmitted through the septal defect. Therefore, right ventricular hypertrophy develops. As a consequence of the dextropositioned aorta and high septal defect, there is an admixture of the venous blood from the right ventricle and arterial blood in the aorta to the peripheral portions of the body. This accounts for the cyanosis found in such cases. This cyanosis may not be apparent when the child is at rest. However, with the slightest exertion, even crying, a cyanosis of a varying degree is one of the characteristic features of this disease. Stunting of growth and marked dyspnea are almost always present with exertion, and as a corollary of this, ease of fatigability. These factors probably are secondary to a decreased amount of blood which is being carried through the pulmonary circulation because of the stenosis of the pulmonary trunk. These children are never able to keep up with the other children of corresponding age and are, in truth, semi-invalids. Physical examination again reveals a cyanosis of the skin and mucous membranes, suffusion of the conjunctivae; the eye grounds reveal engorged and tortuous vessels. Clubbing of the fingers and toes may be extreme. Auscultation of the second left interspace may reveal a harsh murmur. An inconstant thrill may be present. This murmur is not unusually loud and is only fairly well transmitted into the vessels of the neck. Heart sounds are rapid and regular. The laboratory examination reveals a decrease in the oxygen saturation of the peripheral arterial blood; in addition, a secondary polycythemia. This secondary polycythemia is a natural sequence of the individual living in a rarefied oxygen atmosphere. This anoxemia stimulates the bone marrow to form additional red blood cells. Because of the decreased aeration of the circulating blood, the secondary polycythemia is analogous to that found in people living at high altitudes. The electrocardiograph reveals a marked right axis deviation and sometimes a high peaked P-wave.

Because of the abnormalities of the heart and great vessels, certain characteristic changes may be noted on the x-ray examination.

1. Because of the stenosis of the pulmonary artery only a fraction of its usual blood volume is present. Therefore, the usually visible normal prominence of the pulmonary artery is absent. In many instances, there is an actual concavity in this segment of the cardiac contour. A concave shadow in this region in patients with cyanosis, always means that the pulmonary artery is misplaced, absent, or reduced in size.
2. As a result of the decreased pulmonary flow, the pulmonary vessels in the hila are small. The pulsation of these vessels cannot be seen during fluoroscopy. The peripheral lung fields have been described as having an "anemic look" because of their increased radio-translucency.
3. The heart frequently may appear normal in size or be moderately enlarged. In such instances it is due to the hypertrophy of the right ventricle. It overshadows the border of the left ventricle causing enlargement of the heart to the left. The apex is lifted from the diaphragm and has a blunt appearance. This cardiac silhouette has been referred to as a "couer-en-sabot," or "sheep's nose" and "wooden shoe" heart.
4. In 20 per cent of the cases of Tetralogy of Fallot, the aortic arch is on the right rather than on the left. The aorta in this situation arches over the root of the right lung instead of the left, passing on the right side of the trachea and esophagus. In most instances there is then a turn of the aorta to the left as soon as it has crossed the right main bronchus. In crossing to the left of the spinal column, it passes behind the esophagus and trachea displacing these structures forward.

It should be pointed out that the Blalock operation is effective only in a case where there is an anemia of the lungs responsible for the cyanosis. In the case of the Eisenmenger complex, in which all these anomalies are present except the pulmonary stenosis, the pulmonary pressure is normal. Therefore, the operation is of questionable value. It is important, then, to differentiate the Tetrad from the Eisenmenger complex. This can sometimes be accomplished roentgenographically by observation of the pulmonary circulation. At times, the differentiation can be made only at the time of operation with direct measurement of the pulmonary intra-arterial pressure.

Coarctation of the Aorta

Coarctation of the aorta is a stenosis or obliteration of the arch of the aorta at a point distal to the origin of the left subclavian artery, at or adjacent to the site of insertion of the ductus arteriosus. Renaud in 1828 suggested that stenosis was due to a faulty embryonic development of the aortic arch, the fault lying at the point of junction of the 4th, 5th and 6th branchial arches. This theory is an accepted one today. Bonnet differentiated coarctation of the aorta in two groups, termed infantile and adult types. In the infantile type, there is a narrowing of greater or lesser extent of the entire isthmus of the aorta. The infantile type is rarely seen clinically as death usually occurs soon after birth due to the fact that the necessary adjustments in circulation have not been made with sufficient rapidity to meet the circulatory requirements. This condition is also very often associated with other serious anatomical abnormalities of the heart and blood vessels. In the so-called adult type, there exists a more focal constriction one centimeter or less in length and most frequently found at or below the ligamentum arteriosum. The ductus is almost always closed; however, in a small percentage of cases the ductus may remain patent. Bicuspid aortic valves not infrequently are found in association with the adult type of coarctation of the aorta.

The major defect present in the adult type of coarctation of the aorta is the local narrowed or obliterated aorta immediately distal to the left subclavian artery. Obviously, in order to reach the peripheral portions of the body, the blood must take a devious unnatural pathway. Because this route is devious and the blood can be dispensed through a limited number of collateral anastamoses, a higher head of pressure is necessary to maintain adequate distal circulation. Consequently, the left ventricle must perform additional work. This results in left ventricular hypertrophy. It will be noted that the coarctation is placed distal to the left subclavian vein, therefore, all arteries proximal to the coarctation, to the head, neck, and upper extremity carry a high head of pressure.

The collateral circulation takes place mainly through the subclavian artery, the thyro-cervical trunk, the superior intercostal, the first aortic intercostal, and the internal mammary artery.

The history in such patients is not always clearly cut. However, in certain individuals one may obtain a history of headaches or inability to run as fast or as far as his fellows of the same age. The physical examination reveals a well developed individual with no cyanosis or clubbing of the fingers. The face may appear flushed, the vessels of the neck may pulsate markedly. An inspection of the chest reveals enlarged interscapular vessels. A late systolic, typically hemic, murmur may be heard on auscultation in the interscapular area. Along the left border of the heart, a short systolic murmur may be heard. No thrill is present. The most important finding is the demonstration of an unexplained hypertension in a child or young adult. If the disease is suspected, a marked difference will be found in the blood pressure in the upper extremities as compared with the pressure in the lower extremities. In addition, the femoral, popliteal, and dorsalis pedis pulse may be diminished or absent. These findings on physical examination are mainly due to the collateral circulation. The electrocardiogram may indicate a left axis deviation.

On x-ray examination, two of the characteristic findings may be found in the routine postero-anterior view of the chest and the diagnosis can be strongly suspected when considered with the clinical or laboratory data. These are as follows:

1. Absence of the aortic knob. Normally, there is a rounded aortic prominence to the left of the spine at the level of the 5th dorsal vertebra. This knob represents the junction of the first portion of the descending limb of the arch of the aorta, and may be absent in cases of coarctation. This area represents the site of the aortic isthmus which is the portion of the arch involved by this anomaly. The absence of the knob suggests atresia of the aorta. It should be noted, however, that in children this shadow is normally absent or inconspicuous. Probably the presence of the aortic knob in the P.A. view is more conclusive evidence of the absence of a coarctation than is its absence in establishing the diagnosis.
2. Rib erosion. The intercostals running along the margin of the ribs erode the bone in the same manner as aneurysm erodes bones. The characteristics of these rib defects are as follows:
    - (a) Multiple defects affecting more than one rib and frequently multiple defects in the same rib.
    - (b) Defects affecting particularly the posterior portions of the ribs.
    - (c) The lower margin only is affected.
    - (d) These defects are smoothly curvilinear, never rough.
    - (e) Simple erosion occurs without the alterations of the bony trabeculation or other evidence of pathological changes elsewhere in the rib.
    - (f) New bone formation is essentially absent.
    - (g) Pathologic fracture has not been noted.

The surgical procedure for coarctation is best carried out in youth, consequently the diagnosis should be made as early as possible. However, these two signs fail us in the young patient because it takes time for the rib erosion to take place and the aortic knob is normally absent or inconspicuous in the young. Of course, when present, rib erosion is of significance, but its absence means nothing. In the adult, there is an increased incidence of these findings. A diagnosis of coarctation sometimes can be made on the routine chest plate.

Since the defect is found in the arch of the aorta, a clear view of the arch is necessary in order to see that portion of the aorta which is involved in cases of coarctation. This view is obtained in the left postero-anterior oblique position. The aorta may show a defect or break in the continuity of its outline of the upper descending limb of the arch. A defect or break in the continuity of the arch in the region described is pathognomonic of coarctation. No other condition of which we are aware will produce this result.

Other x-ray findings include:

3. Left ventricular hypertrophy. Because the heart must push the blood through the devious collateral circulation into the lower portion of the body, the work of the left ventricle is increased. Left ventricular hypertrophy is commonly associated with coarctation though it is not always present even when the defect in the aorta is marked.
4. Dilatation of the proximal aorta. The portion of the aorta proximal to the aortic constriction is not infrequently dilated.

Treatment

The surgical treatment of patent ductus arteriosus is now a standardized and accepted procedure. In the earlier cases performed elsewhere and at the University Hospital, ligation was practiced almost exclusively. For the past few years, division and ligation has been regarded as the treatment of choice. Ligation has fallen into disfavor because of the possibility of recanalization of the ligated patent ductus. This occurs in approximately 10 per cent of the cases so treated. It would appear that this potential hazard has been overcome by the division and ligation technique. Some operators after division and ligation have interposed a pleural or pericardial flap between the divided ends of the cut vessel as additional insurance against recanalization. At the University Hospital over 100 operations for the patent ductus arteriosus have been performed. In the first 18 cases only ligation was carried out; there were 3 deaths. Two deaths resulted from exsanguinating hemorrhage. The third death occurred in a patient who had previously been ligated but had recanalized with the subsequent development of a sub-acute bacterial endarteritis. She was re-explored a second time and died as a result of acute blood loss. Following the first 18 cases, division and ligation was practiced. There were 69 consecutive cases performed without a mortality. At this time, the fourth case was lost. There has been no subsequent death in this series.

It is undoubtedly true that the first operator has the best opportunity of curing the individual. Therefore, one is obligated to perform the best operation possible, for a second operation in this area is extremely hazardous. Certainly, in almost all cases, we believe that division and ligation is the operation of choice. However, in a small number of patients where the ductus is short and broad or where there is a sub-acute bacterial endarteritis present, ligation might be indicated.

In the operative procedure for the relief of the Tetralogy of Fallot an anastamosis is effected between a systemic artery and the pulmonary artery. The systemic artery used has been usually the subclavian but on occasion the innominate or common carotid. In this fashion, the peripheral blood which is an admixture of oxygenated and unoxygenated blood is short-circuited back into the pulmonary artery so that an increased flow of blood is passed through the lungs for oxygenation. The operative procedure advised by Blalock has been a transthoracic approach opposite to the side of the aortic arch. Approximately 20 per cent of the patients with the Tetralogy of Fallot have a right aortic arch. It is important to establish the side on which the aortic arch is present since the major vessels of the arch are altered in position dependent upon which side of the chest the aorta descends. The rationale for operating on the side opposite from the arch is the availability for the anastomosis of a larger number of major systemic vessels. If the operative procedure is made upon the same side as the arch only the subclavian is available. On the other hand, on the opposite side of the arch either the subclavian, the innominate or the common carotid usually will be available. In this particular type of operative procedure an artificial shunt is made, in a sense, a patent ductus arteriosus. These patients, therefore, will be subject to the additional complications which one observes in a straight-forward patent ductus arteriosus. That such an operative procedure markedly improves the patient cannot be denied. If one observes a single child delivered from a state of semi-invalidism to that of an active "normal" child, no argument would be raised concerning the value of the operation. Undoubtedly, an additional strain has been imposed on the heart as a result of the shunt. However, there are other changes which take place which somewhat offset this disadvantage. Because of the increased aeration of the blood, the coronary circulation carries a higher oxygen content. In this fashion, the additional cardiac strain is combatted. With this increased oxygen content of the blood, an increase in growth of the individual ensues which adds another form of strain. What the end results will be with this particular type of procedure remains to be seen. At the University Hospital, there have been 54 patients with Tetralogy of Fallot operated upon. There have been 7 deaths. There have been some failures, nevertheless the results in general have been good.

In coarctation of the aorta, the operative procedure is a transthoracic approach through the bed of the 5th rib posteriorly. Bleeding may be excessive because of the abnormal collateral circulation. When the stenosis is distal to the subclavian artery and of short extent, the resection of the stenosed area and a direct end-to-end anastomosis is the operation of choice. In certain cases, the stenosis may be so close to the origin of the subclavian artery that such an anastomosis may not be feasible. In this situation, it has been found possible to swing down the subclavian artery and anastomose it either end-to-end or end-to-side to the aorta.

At a recent Surgical Meeting, Gross of Boston reported that he has successfully used a homologous graft of the aorta for bridging defects of great length. Certainly, an end-to-end anastomosis after excision of the stenosed segment should be done where possible. To date, five cases of coarctation of the aorta have been done at the University Hospital. There have been no deaths in this small number of cases. The end results have been completely satisfactory. There were two previous patients who were being prepared for surgery but died before any surgical procedure was done; both of sub-arachnoid hemorrhage. This suggests that such an individual's life is fraught with considerable hazard if no definitive treatment is attempted. At the present time there are additional patients in our own clinic and the Lymanhurst Heart Clinic who are being evaluated for this procedure.

SUMMARY

Certain aspects of the incidence, the pathological physiology, the diagnosis and the treatment of patent ductus arteriosus, Tetralogy of Fallot and coarctation of the aorta have been presented. The experience with the operative procedure used for the correction of these defects has been briefly discussed. Certain important differences have been emphasized concerning the end results to be anticipated with these operative procedures. The division and ligation of the patent ductus arteriosus is a curative procedure. The excision and end-to-end anastomosis of the coarctated aorta would lead one to anticipate a similar curative result. Whether or not this will prove to be true in all instances remains to be seen. On the other hand, the Blalock-Taussig operation for the Tetralogy of Fallot is a palliative procedure. In these individuals a patent ductus is reconstructed with all its attendant hazards. However, one need only see one rehabilitated child to be convinced of the marked benefit of the operative procedure.

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Regional Enteritis*

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Introduction

History. Interest in regional enteritis as a disease entity has largely followed the publication of the comprehensive, descriptive article by Crohn, Ginsburg and Oppenheimer[10] in 1932. However, many articles were written prior to that time describing cases or series of cases which would now be classified as regional enteritis. In 1806, Combe and Saunders published a gross pathological description of a case which many believe to have been regional enteritis. Since that time, many cases of intestinal inflammatory tumors have been described in the literature under a variety of headings.

Although Crohn, et al., at first believed the disease to be confined to the distal ileum, they and other investigators have since shown that it may occur in any portion of the small or large bowel. However, the distal ileum is involved in the great majority of cases.

Incidence. An increase in the number of cases has been noted in very recent years and much of this is due to increased interest in regional enteritis as well as to greater use of diagnostic roentgenographic studies. However, many investigators believe that there is also an actual increase in the occurrence of the disease.

The purpose of this paper is to summarize the recent concepts of diagnosis and treatment of regional enteritis.

Etiology

Specific Factors. The etiology of regional enteritis has not been found. A large number of agents have been suspected on the basis of clinical and experimental evidence, but a definite causative factor has not been determined. A list of suspected agents includes: (1) bacteria: B. coli, B. dysenteriæ, tubercle bacillus, and others; (2) bacterial toxins, (3) animal parasites, (4) viruses, (5) allergy, (6) sarcoidosis, (7) achylia gastrica, (8) foreign bodies, (9) blocking of lymph channels, (10) impairment of blood supply, (11) trauma, (12) appendiceal inflammation.

Bacterial invasion is believed by many to be the most important factor causing regional enteritis. Most investigators state that several factors may be involved, but that bacteria are the most likely primary or exciting cause, and that it is probable that these organisms have a predilection for lymphatic structures.

Predisposing Factors. Predisposing factors, aside from specific etiologic agents, are often mentioned as being important. Personality pattern in patients with regional enteritis is characteristic, according to Bockus,[3] who states that he has encountered very few calm, phlegmatic persons with this disease. He says, "The most prominent personality traits were anxiety and emotional immaturity. It has seemed to me that emotional immaturity is even more pronounced in patients with chronic regional enteritis than in those with chronic ulcerative colitis."

The age group affected includes a wide range, but the great majority of cases are between fifteen and forty years of age.

The sex incidence shows that more males are affected in a ratio of 3:2 or 4:3 according to most statistics.

Climate is believed to play a role in the Western Hemisphere, as the disease is rare in southern sections of the United States, in Central America and the coastal regions of northern South America.

Other factors, once considered important but later disproved, are a familial tendency and predilection for the Jewish race.

Pathology

Early Stages. Little is known about the gross and microscopic changes occurring in the early stages of regional enteritis because the disease is not recognized at operation or roentgenographically until it is well defined, but it is believed that it begins in the interstitial structures of the bowel wall as a proliferative process which gradually becomes a cicatrizing granulomatous lesion.

Pathological findings have been described in a few early cases in which symptoms had been present only a few days and roentgenologic findings were negative (Harris[22]).

Localized Involvement. This is the most frequent form of the disease in well developed cases. Any portion of the small or large bowel may be involved, but the usual site is the terminal ileum.

1. Gross changes observed are a thickened, brawny, inflamed bowel wall which feels edematous and rubbery. The serosa may or may not have patches of fibrin and frequently small tubercle-like structures are present which may cause confusion with tuberculosis. The mucosa is reddened and ulcerated. The ulcers are usually more superficial than those in ulcerative colitis and more areas of intact mucosa are found in between. The lumen is usually narrowed by the progressive thickening and scarring. The mesentery is thickened and boggy and usually contains several enlarged lymph nodes. Extension of the mesenteric fat over the serosa is a characteristic feature in well developed cases, giving a "cobblestone" corrugated appearance. The mucosal involvement corresponds closely to the areas where the serosa is encroached upon by mesenteric fat. Abscesses and fistulas resulting from perforation of ulcers are frequently seen along the mesenteric border of the bowel. These may communicate internally with adherent loops of small

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bowel, large bowel, or bladder; or externally through the abdominal wall.

Cases which have undergone remission present a somewhat different appearance. The bowel wall is thickened and leathery, devoid of its usual flexibility and distensibility. Adhesions frequently result from organization of the plastic exudate.

2. Microscopic changes seen are chiefly proliferative: edema with lymphocyte and plasma cell infiltration, areas of fibrous tissue proliferation, ulcers, tubercles, but no caseation necrosis. (The tubercle formation presents a microscopic picture similar to sarcoidosis and some have suggested that regional enteritis is due to this disease.)

Scattered Involvement. This occurs in cases of ileojejunitis and ileocolitis. Here it is unusual to find gross, dense mass formation and the lumen of the intestine does not become occluded. "Skip areas" are characteristic with diseased portions of the bowel scattered and separated by intervening normal areas. Fistulous tracts are much less commonly found than in cases with localized involvement.

Involvement of the Colon. This is usually described as being typical of regional enteritis, but Bockus [2] says, "The disease in the colon does not differ pathologically from that seen in ordinary idiopathic ulcerative colitis." In 1938, Lewisohn [30] expressed doubt that segmental enteritis represented a clinical entity, stating that the lesion may turn out to be a milder form of ulcerative colitis. Cave [7] reviewed 80 cases operated on primarily for ulcerative colitis in which 7 cases showed changes in the small intestine resembling regional enteritis, but the findings in the colon were not described. One of our cases operated on for ulcerative colitis showed gross and microscopic changes of regional enteritis in the colon, terminal ileum and appendix.

Diagnosis

Clinical Manifestations. The clinical manifestations of regional enteritis vary considerably and to some degree parallel the site and extent of the disease. The cardinal symptoms are abdominal pain, diarrhea and loss of weight.

In acute cases, abdominal pain is the outstanding symptom. It is usually intermittent and cramp-like and more severe in the right lower quadrant. It is very easily confused with acute appendicitis and, because of this, most acute cases are first discovered at the time of operation for appendicitis. Most surgeons express the opinion that a differential diagnosis cannot be made preoperatively in many cases.

Chronic cases present varied symptoms. Diarrhea and weight loss are common in cases with symptoms of enteritis. The diarrhea is usually non-bloody and a macrocytic anemia is frequently present. Obstructive symptoms of nausea and vomiting with weight loss are prominent in cases where the bowel lumen is markedly narrowed. This occurs chiefly in the localized form of the disease.

Symptoms of chronic abdominal or pelvic abscesses or fistulas occur in cases where ulcers have perforated into the abdominal cavity or adjacent viscera. External fecal fistulas occur when ulcers perforate into the mesentery, form abscesses which become attached to the abdominal wall and open externally on the abdominal wall either spontaneously or secondary to operation.

Perianal fistulas or abscesses are frequently associated with the disease. These are believed to be due to crypt abscesses resulting from the diarrhea rather than direct extension from the involved bowel. Such complications may be the most prominent clinical feature of the disease in some instances.

Fever may or may not be present in all forms of the disease, but the most common cause of fever is the presence of mesenteric abscesses resulting from perforation of mucosal ulcers along the mesenteric side of the bowel.

Hemorrhage from the gastrointestinal tract occurs in a low percentage of cases.

Physical Findings. These are usually of little help. Abdominal tenderness is most pronounced in the acute cases. A palpable mass in the right lower quadrant of the abdomen may be found when the lesion is localized.

A palpable mass may also be felt by rectum in these cases, and fistulas of the abdominal wall may occur.

Laboratory Findings. (1) A macrocytic anemia is frequently present. (2) The leucocyte count and sedimentation rate are elevated in acute cases and in exacerbations. (3) An eosinophilia occurs in some cases. (4) The blood proteins may be low—especially in debilitated patients.

Roentgenologic Findings. These depend on the gross changes in the bowel resulting from the pathological process which has taken place, and may be demonstrated by barium meal or barium enema. Sometimes both procedures will show positive evidence, but when one has proved negative, it is wise to do the other procedure as well.

Kantor's "string sign" is the most frequently described roentgenologic finding in regional enteritis and is considered almost pathognomonic of the disease. It shows up as a narrowed area of barium in the small bowel where the lumen has been encroached upon by the proliferative disease process. It is usually found in the distal ileum. Brown [5] has listed the roentgenologic signs according to importance and frequency as follows:

1. Deformity of contour of the bowel wall.
2. Narrowing of the lumen of the intestinal tube.
3. Loss of the mucosal pattern.
4. Hourglass constrictions in the course of the bowel.
5. Rigidity and immobility of the involved segment.
6. Displacement of adjoining segments of the bowel as a result of pressure by pseudo-tumors.
7. Internal fistulous tracts.
8. Hypermobility of the intestinal contents.
9. Stenosis with dilatation of the proximal bowel.

The findings in the scattered form of ileojejunitis are an irregular fuzzy outline and narrowed lumen of the involved areas alternating with areas of dilatation in the uninvolved "skip areas." The "string sign" may occur in the distal ileum. The barium enema is usually negative in this form of the disease.

The atypical roentgenologic features have been discussed by Yunich and Crohn[45] as follows:

1. Negative roentgenograms occur in the presence of ileitis.
2. Minimal radiographic changes in the mucosal pattern and ileal margins may be misinterpreted by competent radiologists. These changes may be so inconstant and ill-defined that they are either overlooked or their importance is discounted. Emphasis is placed upon proper appraisal of minimal changes early in the disease as cases have been followed where early minimal findings were reported negative but where examination a few months later showed the typical "string sign."
3. Sufficient use of the X-ray is necessary for diagnosis. If barium meal or enema alone does not give evidence, both types of study should be used.

Bockus[3] states that, except in patients with symptoms simulating acute appendicitis or peritoneal irritation where immediate exploration is required, positive roentgenologic abnormalities should be demonstrated before surgery is done.

Differential Diagnosis. 1. Acute appendicitis is most commonly confused with the acute stage of regional enteritis and, as has been mentioned, the differential diagnosis is sometimes impossible to make before operation. A few points which may cause one to think of regional enteritis are: (a) Prodromal symptoms are less sudden in onset. (b) Abdominal pain is less well localized. (c) Rebound tenderness is less definite. (d) Diarrhea is more common.

2. Chronic ulcerative colitis may be confused with the chronic stage in which the chief symptoms are those of diarrhea. Points of differentiation are: (a) Roentgenologic findings are usually characteristic in both diseases. (b) Sigmoidoscopic findings are usually characteristic in ulcerative colitis. (c) The diarrhea is usually less prominent in regional enteritis. It is usually non-bloody with less pus. (d) A palpable mass is much more common in regional enteritis.

3. Intestinal tuberculosis may be very difficult to rule out on gross appearance, and roentgenologic findings may be similar.

The following points are of help: (a) The leucocyte count is up in acute regional enteritis and in exacerbations, but not in tuberculosis. (b) The absence of pulmonary tuberculosis is evidence against intestinal tuberculosis. (c) Tuberculous lesions are usually more scattered and the ulcers lie chiefly in the transverse axis of the bowel. (d) Tubercle bacilli must be demonstrated by staining or guinea pig inoculation to establish a diagnosis of tuberculosis.

4. Neoplasms of the small bowel are rare and are best differentiated by biopsy of a node or of the diseased bowel.

5. Amebiasis is differentiated on the presence or absence of endamœba histolytica in the stool and by the sigmoidoscopic and roentgenologic findings.

6. Diverticulitis is characterized by its roentgenological findings.

7. Actinomycosis is found in the bowel occasionally and may involve the cecum. It is diagnosed by finding the characteristic sulfur granules.

8. Syphilis of the intestine is rare but may occur. (a) Congenital syphilis may produce constriction and stenosis in the terminal ileum. (b) Primary syphilis usually involves the lower colon and rectum. (c) Tertiary syphilis usually involves the jejunum and upper ileum.

9. Other diseases which may at times be confused with regional enteritis are chronic intussusception, twisted ovarian pedicle, pelvic tumors and cysts, Meckel's diverticulum and postoperative adhesions.

THERAPY

Medical Treatment. There is no specific medical treatment for regional enteritis and medical management consists of supportive measures, including bland diet high in vitamins, iron and liver extracts, rest and sunshine, and paregoric where necessary.

Cases best handled conservatively are:

1. Mild cases in which the symptoms are not disabling.

2. Acute cases without perforation (these are usually discovered at operation). A high percentage of acute cases go into a spontaneous remission and recover without surgery.

3. Extensive scattered involvement in cases of ileojejunitis makes resection or short circuiting operations impossible because of the large amount of bowel that would have to be removed or excluded. Fortunately, these extensive cases tend to have spontaneous remissions much more than do the localized chronic cases, and they usually respond fairly well to medical management. While improvement is gradual, it tends to increase steadily.

The majority of investigators, both medical and surgical, favor surgical treatment in most cases.

Surgical Treatment. 1. Acute cases are usually discovered at operation for acute appendicitis and the problem then arises as to what is the best procedure to follow. It is generally agreed that resection or short-circuiting procedures should not be done, but there is disagreement as to whether or not the appendix should be removed. Fistulas may develop following either procedure.

2. Subacute or chronic cases with involvement of a portion of bowel which can be sacrificed are best treated by surgery, but there is disagreement as to what is the best procedure. Some favor excision of the diseased bowel while others strongly favor a short-circuiting operation with exclusion. Still others favor the short-circuiting procedure followed by resection in a later stage.

(a) Resection procedures of one type or another have been recommended by most authors until very recent years. (Shapiro,[40] Marshall,[31] Fallis,[14] Bockus,[2] Pugh,[34] and Jameson and Hoey.[26]) In 1945, Bockus [3] commented on Ginzburg and Garlock's series treated by short-circuiting with exclusion and stated that, if a longer period of observation bears out their results, it would appear preferable to resection with internal anastomosis. Cave,[7] in 1945, reviewed 23 cases and concluded that cases operated on in the early stages of the disease stood a good chance of permanent cure by short-circuiting with exclusion. But he felt that cases with ulceration, stenosis and fistulas would require further surgery before they could be cured.

(b) Short-circuiting ileocolostomy with exclusion was recommended as the operation of choice in 1939 by Ginzburg, Colp and Sussman.[18] They discussed 32 cases treated by this method with better results than by resection and with zero mortality. In 1942, Ginzburg and Garlock [19] reviewed 77 cases and, in 1946, Garlock [16] reviewed 100 cases treated by this method. He reported a zero mortality, spontaneous closure of all but three cases of external fecal fistula and of all ileovesical fistulas, and a smaller number of recurrences than by any other form of surgical treatment.

The experience of the Mt. Sinai Hospital group in New York in regard to surgical treatment is interesting. They at first believed that resection was the operation of choice and used this method. However, in a number of cases they did a short-circuiting ileocolostomy with exclusion as a preliminary to later resection. The clinical improvement in these cases after the short-circuiting procedure was so rapid and marked that in many the resection was indefinitely postponed. These workers were so impressed by the results with ileocolostomy with exclusion that they abandoned resection in its favor. Since the first optimistic report in regard to this procedure, they have published several follow-up reports on larger series and have retained their good opinion of its worth.

Resection in one or two stage procedures has been recommended by many investigators but few of them have been able to achieve the results of the Mt. Sinai group in regard to either mortality or recurrences.

A number of these authors admit that the results obtained by resection are not satisfactory and express the hope that the reported success of ileocolostomy with exclusion will continue to hold after a longer test of time.

Objections of most surgeons to ileocolostomy with exclusion are many: obstruction and blow-out of the blind stump, diarrhea, and ulcerations that may occur in the colon between the anastomosis and the ileocecal valve. These objections, and others, have been discussed and answered from time to time by the Mt. Sinai group and, in 1947, Colp [8] states, "Many of the theoretic objections voiced against primary enterocolostomy with exclusion in regional ileitis as the cause of immediate and late postoperative complications have never materialized."

From the foregoing, it is apparent that opinions vary considerably as to the type of surgical procedure to use. The group which appears to have had the widest experience over the longest time, and which has used both resection and short-circuiting with exclusion, presents a strong case for the latter procedure. Their results have continued to be as good as first reported and it is difficult to ignore their reports of lowered recurrences with zero mortality.

3. Preoperative preparation consists of supportive measures to which various workers attach varied significance. Measures generally accepted as being important are: (a) bed rest, (b) high protein diet, (c) vitamins, (d) plasma and blood, (e) trial on chemotherapy and antibiotics.

The importance of preoperative preparation cannot be over-emphasized in this disease in which patients are often severely debilitated to the point where they are poor operative risks.

4. Exacerbations and remissions are characteristic of chronic regional enteritis. Patients operated on during a remission stage stand surgery better and it is well worthwhile waiting for a remission before attempting any surgical procedures. Observation of a patient under good medical management for a period of time will enable one to decide upon the optimum time for surgery.

5. Operative technic. Garlock [16] stresses the following points:

(a) The Miller-Abbott tube passed preoperatively serves to decompress the bowel and is a valuable aid in quickly identifying the various levels of bowel.

(b) Trendelenburg position aids in giving good visualization of the bowel.

(c) Left rectus incision is used because it gives good exposure and, should a second operation be necessary, it can be done on the right side in a field free from adhesions.

(d) Diseased bowel should not be separated from adherent viscera because of the danger of opening sealed-over fistulous tracts.

(e) "Skip-areas" should be carefully looked for before proceeding with the ileocolostomy.

(f) Divide the ileum in all cases where a short-circuiting ileocolostomy is done. The dangers involved in doing a short-circuiting ileocolostomy without dividing the ileum have been repeatedly brought out by the Mt. Sinai group. Cases in which this procedure has been tried have done poorly. In some of these mere sectioning of the ileum at a subsequent operation has produced dramatic clinical improvement.

The dangers involved in doing a short-circuiting ileocolostomy without dividing the ileum have been repeatedly brought out by the Mt. Sinai group. Cases in which this procedure has been tried have done poorly.

Holm [24] in 1933, reported two cases of obstruction of the terminal ileum due to adhesions in which an ileocolostomy was done without dividing the ileum. Subsequently, these patients developed signs of obstruction, and operation showed the ileum between the anastomosis and site of obstruction to be markedly dilated, elongated, inflamed and ulcerated. Dog experiments reproducing these conditions showed similar results.

Several cases have been reported in which a short-circuiting ileocolostomy without exclusion has been unsuccessful. In some of these mere sectioning of the ileum at a subsequent operation has produced dramatic clinical improvement.

(g) Division of the bowel should be done several inches proximal to any grossly diseased areas. It is believed that most recurrences are due to overlooked areas which are not excluded or resected at the first operation. For this reason writers advocating resection stress the importance of wide resection.

(h) When resection is done and the cecum is involved, it is not necessary to extend the resection to the transverse colon. It can be resected at the level of the ascending colon.

(i) Side-to-side ileocolostomy is recommended as the easiest and safest procedure, but there is also an objection to it. In some cases the blind stump of the proximal ileum becomes distended and inflamed. This can be avoided by placing the site of anastomosis almost at the end of the stump.

6. Extent of surgery. In cases of extensive involvement the problem arises as to how much bowel can be removed or excluded. This is a matter of surgical judgment to which no definite answer has been given. Cases have been reported in which bowel has been resected until only 3 feet of small intestine remained. As would be expected, these cases were then serious nutritional problems.

Todd, et al.,[43] conducted metabolic studies on a patient with only 3 feet of small intestine remaining following five resections. They found that: Carbohydrates were practically 100 per cent utilized. Proteins were practically 69 to 76 per cent utilized. Fats were practically 53 to 55 per cent utilized. Better fat utilization was obtained on a high fat diet, but because of the large amount of fatty acids lost in the stool, it was impossible to maintain an adequate calcium blood level, even with high calcium and vitamin D diet. Therefore, it was necessary to put the patient on a high carbohydrate, low fat diet with high calcium and vitamin D to prevent calcium from falling below tetany levels.

Roentgen Therapy. Brown [5] discussed three cases of regional enteritis which recurred following surgery and were subsequently given roentgen therapy. Approximately 2000 r were given in ten treatments over a period of twenty days. Remarkable improvement was reported, but this has not been substantiated in any large series of cases.

Results. 1. Mortality figures are used in comparing ileocolostomy with exclusion to resection and, in general, the mortality is lower in the former. But confusion exists because some investigators use ileocolostomy with exclusion only in very ill and complicated cases, while others use it only in the uncomplicated cases and still others use it in both types of cases. Because of this, the mortality figures vary far beyond the range attributable to the procedure in itself.

2. Recurrence figures vary for the same reason and they are also unreliable because of the lack of a standard measure in reporting "cures."

SUMMARY AND CONCLUSIONS

A brief general review of the literature on regional enteritis has been presented with special attention to recent developments in surgical treatment.

Medical treatment alone is indicated in only a few selected cases.

Surgical treatment is usually the treatment of choice. In very recent years there has been a definite trend toward the abandoning of resection of the diseased bowel in favor of the more conservative short-circuiting ileocolostomy with exclusion.

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LITZENBERG LECTURESHIP

A memorial tribute to one of Minnesota's most famous medical scientists, the late Dr. Jennings Crawford Litzenberg, has been established by the Minnesota Medical Foundation in the form of a lectureship, Dr. Erling S. Platou, president of the foundation, announced.

All physicians in the state and the public were invited to attend the first of the Litzenberg lectures Friday, Oct. 22. Dr. Everett D. Plass, head of the department of obstetrics and gynecology at the University of Iowa, spoke on "Advances in Maternal Welfare."

LET'S TALK ABOUT HEALTH

"Let's Talk About Health" is a program presented by Dr. Donald A. Dukelow on KUOM, the University of the Air, each Monday morning at 11:15. The following scheduled programs are of value to everyone who is interested in the health of his community.

November 15—Medical Education
November 22—A Century of Public Health
November 29—Tuberculosis—The Christmas Seal Story
December 6—County Health Departments
December 13—Why Kill Our Children?
December 20—Your Christmas Presents
December 27—New Years Resolutions

Psychosomatic Medicine in General Practice

Philip K. Arzt, M.D.
St. Paul, Minnesota

Though one may say that I have told nothing new,
the arrangement of the material is my own.—Pascal.

* * * * *

PSYCHOSOMATIC medicine,[1] the concept that the emotional life of a person has something to do with illness, has long been recognized by physicians and is not a new science. Socrates (469-399 B.C.) is reputed to have said that the Greek physicians could not cure many diseases "because they are ignorant of the whole"; that they could not cure the body without "curing the mind, too." However, with the advent of "the machine age of medicine" the patient was soon considered a physiological mechanism, and disease, a disorder of organs and cells. The psyche of man was entirely separated from illness, and in many instances was ignored and forgotten.

The recent popular acceptance of the name, psychosomatic medicine, is, in many ways, to be regretted. It sounds too much like an announcement of marriage between the mind and the body (psyche and soma), with all of the specialties of surgery, medicine, and psychiatry, members of the bridal party. It also looks like psychiatry has been sanctioning an illicit relationship if the union has just been consumated because psychiatry has been, for years, talking of "the patient as a whole"; that man was a total indivisible unit, therefore, every somatic process at once reverberated in all of the individual and was notable in his emotions; and conversely, that every emotional reaction, without regard to the degree, had immediate repercussions in every tissue and cell of the body. Now, it is not so much the "either-or" (either organic or functional) concept, but rather how much of one and how much of the other. (Fig. 1.)

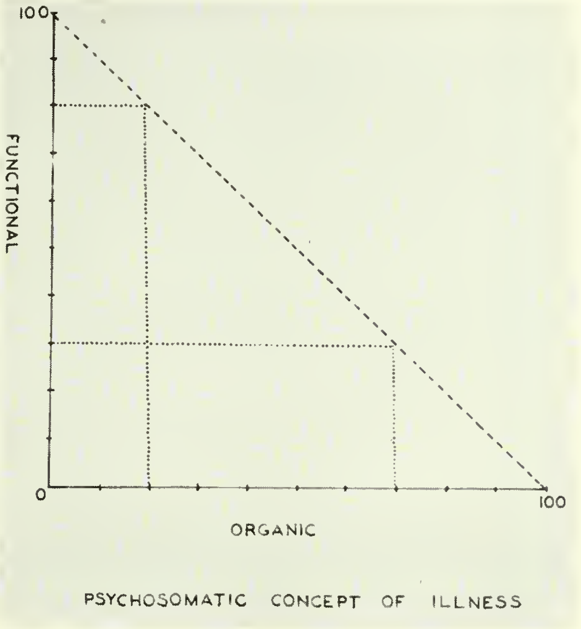

Fig. 1. Theoretically all illness will fall along the hypoteneuse of the triangle and will have a functional and an organic component.

Between the few patients seen in general practice with a frank psychosis and those seen with obviously only physical disease, there is a vast army of patients who are ill and come to the physician for relief. For purposes of classification, this group can be divided into five categories.

1. *Pure functional cases:* In this group are the patients who are not psychotic, yet do not have any organic disease present to account for their illness.

2. *Organic cases with a functional overlay:* In this group are the patients whose symptoms are out of proportion to the amount of organic changes present. In other words, the symptoms are dependent in part on emotional factors.

3. *Organic cases with mental and emotional symptoms:* These are the cases in which the organic illness itself produces a mental symptom. Notably among these are certain types of epilepsy, encephalitis, arteriosclerosis, and syphilis. This division could also be classed as a somatopsychic problem, inasmuch as the psychic or emotional and mental symptoms are due primarily to the somatic disease. In this group also, are those cases of pure organic disease in which there are emotional factors present which are the result of apprehension, fear, or uncertainty. The emotional reaction to the original illness does not aggravate the original condition. One can cite numerous instances of organic heart disease, where fear plays an important role in the life and activity of the patient.

4. *Dysfunction of the vegetative nervous system:* In this group are cases of migraine, asthma, essential hypertension. They are generally considered to be physical diseases, but the psychic factor may be of great importance in their etiology and of even greater import in their management and treatment.

5. *Structural alteration:* In this group we are concerned with the possible relationship of psychological disturbances to actual structural alteration. Study in this field is still in more or less of an embryo stage, yet definite progress is being made. Notable examples here would be the role emotional factors play in production of peptic ulcers and vascular changes in hypertension.

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[1] The reader is referred, for more detailed information on this subject, to the publications of Adolph Meyer, Weiss and English, Flanders Dunbar, Alvarez, and Freud. The bulk of the material in this paper was obtained from these sources and specific references through the text will not be made.

We are primarily interested in this discussion in the first three divisions: the functional cases, the organic cases with a functional overlay, and the organic cases with purely mental, emotional or behavioral symptoms.

In order to understand psychosomatic medicine, it is necessary first to understand the forces at work in the formation of an individual's personality, and second to understand psychopathology.

Personality development begins at birth. The first stage of an individual's life, infancy, continues until about the second year. During this period the important factors are early feeding habits, bowel and bladder training, sleeping, and general health. At this early age the child can sense attitudes and reacts accordingly in the way in which he obtains the most gratification or approval, whether or not the action happens to be what he wants. For instance, in bowel or bladder training the infant can feel and sense disapproval on the part of the parent. He early learns that he can please or displease his mother at will by a bowel movement.

The second stage extends roughly to puberty. The growth of emotional relationships and adaptibility to other individuals and a sense of interpersonal relationships develop. Obviously, through this period, if the individual, for one reason or another, is unable to expand his ego and to experience the stimulus of success, there will be a disturbance in the ego function which will, later in life, condition his response or reaction to various environmental and situational factors. Each individual will react in a different manner to the same situation. I like to visualize this by the formula: I + S = R. *I*ndividual plus *S*ituation equals *R*eaction. Each person will react according to his own pattern which in turn is dependent on his own personality structure.

The next period of development is adolescence. During this period there is a great emotional upheaval in the life of the individual. The individual must grow up and be emotionally emancipated from the parent. Here the responsibilities of adulthood may at times be overwhelming, and there will be a tendency to want to remain a child. The desires of an individual, the instinctive cravings and strivings, the needs for recognition are often not in accord with attitudes, habits, and demands derived from early family relationships, church, school, ethical and moral standards.

The next stage is maturity, which in turn is followed by the involutional stage. It is here that the drives and ambitions are realized; that interpersonal relations expand to the fullest and one can see how I + S = R really operates. In the involutional period there is a general decline of activities and interests.

The personality is nothing but the sum total of all the early impressions and experiences. The experiences in adolescence and maturity while important, are in reality merely superstructure and decoration, as it were.

Psychopathology is pathology of the personality. It can be seen from the above brief description that pathology develops early in life. It may or may not cause symptoms later in life.

There are many psychopathological phenomena. The most important is anxiety. Anxiety is the result of either conscious or unconscious ideas, and it functions in normal behavior as well as in the production of illness of a psychosomatic nature.

There are two components of anxiety, a component in the psychic field and a component in the somatic field. This latter component is the actual physiological response of the individual to anxiety and is manifested by an increase in pulse rate, blood sugar and adrenalin in the blood, muscle weakness, tension and tremors, motor activity, dilated pupils, pallor or flushing, deep and rapid respirations, perspiration, urinary frequency, and occasionally involuntary bladder and bowel emptying, fainting and unconsciousness.

We have all heard the expressions "I was rooted to the spot," "I was paralyzed with fear," "My heart was in my mouth." These are all physiological responses to anxiety. There are other expressions, the result of unrecognized anxiety, and more psychosomatically expressive such as "I can't stomach that," perhaps said by a person who vomits when he is emotionally upset, or "He is a pain in the neck," or "That gives me a pain in the back." These are just a few of the common expressions which reflect symptoms which can be produced by unpleasant happenings or emotional disturbances.

One can see that all through life, an individual is torn between fears and desires, likes and dislikes, urges and resistances. Thus there is a clash or conflict between two opposing, contradictory strivings of the personality. This creates a sense of tension, as it were, and psychic tension thus created must be directed and channelized. If not properly directed and channelized (sublimated), symptom formation occurs.

How this tension is directed depends again on early character formation. Often the cause of symptom-producing anxiety is unknown because the conflict causing it is in the subconscious mind. Memory impressions are made and forgotten or repressed. They are stored as it were in the unconscious or subconscious mind. If a conflict is highly charged with anxiety, the repression will likely be stronger, and more difficulty will be encountered in bringing the traumatic event to the surface.

In any illness the anxiety may not be recognized as such, and it may not be apparent. Frequently it is converted into physical symptoms. These symptoms of dysfunction of a system or a part will always follow a functional rather than an anatomical pattern. In other words the use of the part will determine the disability. A common example of this is "stocking or glove" anesthesia.

In arriving at a psychosomatic diagnosis one can see that diagnosis by exclusion is a negative approach. In addition to the regular history, examinations and laboratory procedures, the patient must be studied as an individual.

In taking a psychosomatic history one can see from the foregoing the importance of inquiring into the birth and infancy period of development, the school history,

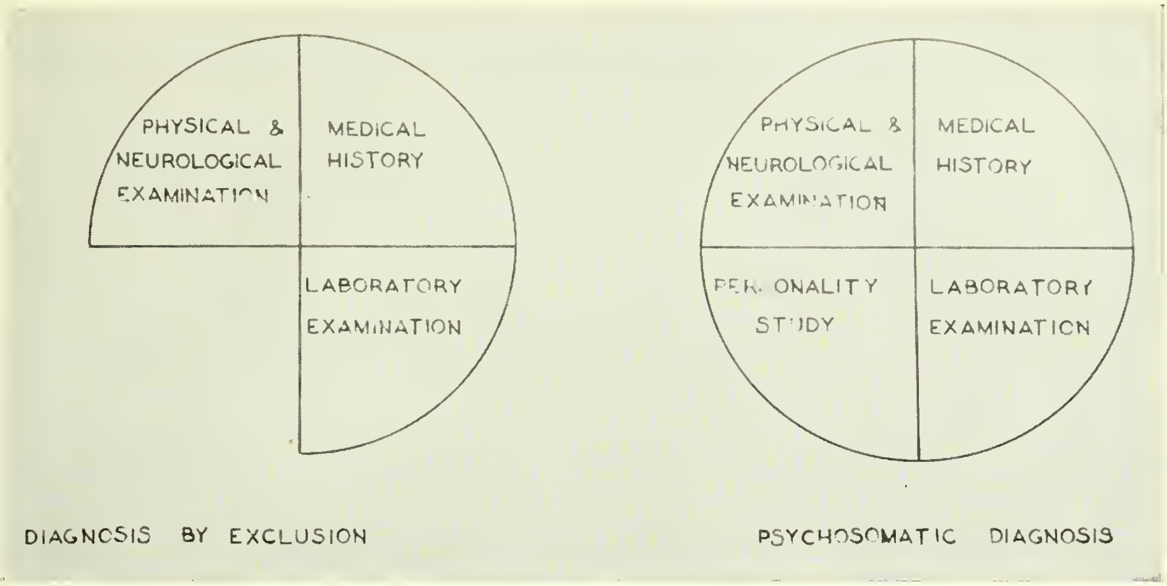

Fig. 2. The inclusion of a personality inventory completes the whole.

home life and relations to the parents and siblings, the sexual development, religion, vocation, social adjustment, physical status, marital history, etc. (Fig. 2.)

When a psychosomatic diagnosis has been made, what can be done by the general practitioner to relieve the patient of his symptoms? The greatest majority can be helped without the aid of a psychiatrist. When the diagnosis has been made, the condition should be explained logically and simply to the patient, avoiding the trite phrase, "Go home. There is nothing the matter with you. It's all your imagination." Repeated examinations should be avoided. These, instead of reassuring the patient, only tend to create a doubt in his mind as to the competence of his physician, and also serve to cement more firmly the functional foundation of the symptoms. Many patient's conflicts will be very superficial and can be "talked out and explained to him" by a friendly, sensible, philosophically inclined physician who has enough time to listen. Other cases will respond to simple environmental manipulation. Some will require interviewing other members of the patient's family.

Other cases of course will be more complicated with deeper seated and more complex conflicts. Occasionally some will respond to the various forms of narcosynthesis using sodium amytal or pentothal. These are not complicated procedures, but should be carried out by someone who has had experience in the technique. These drugs release the inhibitory influence of the cortex. Thus with the "censor" not functioning, the patient can talk more freely and bring to the surface ideas and feelings which have been repressed. During the procedure positive suggestions can be made which will relieve the tension and eliminate the symptoms.

In other individuals, a form of psychotherapy, deeper than superficial ventilation and reassurance, is necessary. A few will require formal psychoanalysis.

Before concluding, I will mention, briefly, a few cases which demonstrate graphically, examples of the first three groups mentioned earlier in this discussion. The following brief abstracts will illustrate the effect emotions have on physical functions.

Case No. 1: This case will illustrate an illness, purely functional in nature. (Group 1.)

A 23 year old married white male whose chief complaint was total blindness which came on following a near-by shell burst. The patient did not lose consciousness, and he was not apparently injured in any other way. He was lying down and protected from flying shell fragments and debris. The past medical history was noncontributory. A detailed neurological examination was negative except for the blindness. There were no abnormal physical findings. Skull x-rays were normal and showed no evidence of fracture. The spinal fluid was clear, under normal pressure, and the chemistry was within normal limits. The electroencephalogram showed no abnormalities. (Fig. 3.) A diagnosis of hysterical blindness was made, and he was given intravenous sodium pentothal. During the pentothal interview he described, vividly, the action on the Anzio beachhead—(he had refused to talk of this before)—and how he had tried to warn his buddy of an approaching shell. Then, during the interview, he became highly agitated and said, "Oh, God! I can't stand to see it!" He then told of the shell burst, and of his buddy being blown to bits. He was encouraged to tell more of what followed, and the suggestion was made that he could see light, then the examiner, and then the objects in the room. During the interview he recovered his sight completely, and testing of the eyes after the interview when the effect of the pentothal had worn off, showed that he had 20/20 vision.

Case No. 2: This case illustrates another instance of

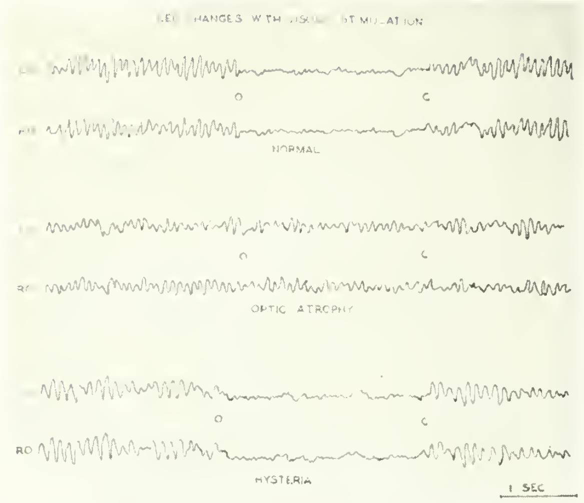

Fig. 3. The top figure shows a normal EEG with eyes closed, open, and closed. The second recording shows an EEG and the response to light stimulation in a patient with interruption of the visual pathway to the occipital cortex. The third recording is an EEG in a patient with hysterical blindness, showing there is not an interruption of the visual pathway.

a purely functional illness. (Group 1.)

A 22 year old, single, white, pre-medical student whose chief complaint was inability to write. This came on suddenly while working as an accountant during summer vacation. He had no other complaints referable to the arm or hand, such as sensory impairment or muscle weakness. He was able at all times to write or print on the blackboard, to typewrite, and to use his hand in any other way. During the first interview he was non-commital and little of significance could be learned about his early life. His father died when he was young, and he had to work his way through school. He had a good service record in the army and several months in combat.

The physical examination and neurological examination were normal in all respects. He gave one the impression of being rather unconcerned about his disability. (Fig. 4.)

Treatment with hypnosis failed to reveal any conflicts. During hypnosis, however, he did talk of concern over masturbation, a desire to get married and inability to do so because of finances and the long period of school ahead of him. After one session of hypnosis, he had a marked functional improvement.

Case No. 3: This case will illustrate an example of organic disease in which the symptoms are exaggerated by the emotional component.

A 42 year old single white farmer-common laborer whose chief complaint was "a kind of blurring of vision." This had persisted for two years. He was unable to read a newspaper, although he could tell time on a clock on the wall some distance away. He also complained of occipital headaches and generalized nervousness.

The past medical history was non-contributory. The physical examination was normal. The neurological examination was negative except for palor of both optic discs. Visual acuity was 20/200 in each eye. The peripheral field taken on the tangent screen showed a concentric contraction about the same in each eye and which contraction amounted to about twenty isopters in all the meridians. The central field of each eye showed a complete loss of color vision and a relative scotomata for white in the macular area of each eye. The scotomata was not complete in that the patient was able to see the white object in the macular area; however, the image was very blurred in contrast to its clarity in the paramacular area. The ocular findings were not sufficient to adequately explain this marked loss of visual acuity. The spinal fluid examination and skull x-rays were normal. The electroencephalogram showed no abnormalities.

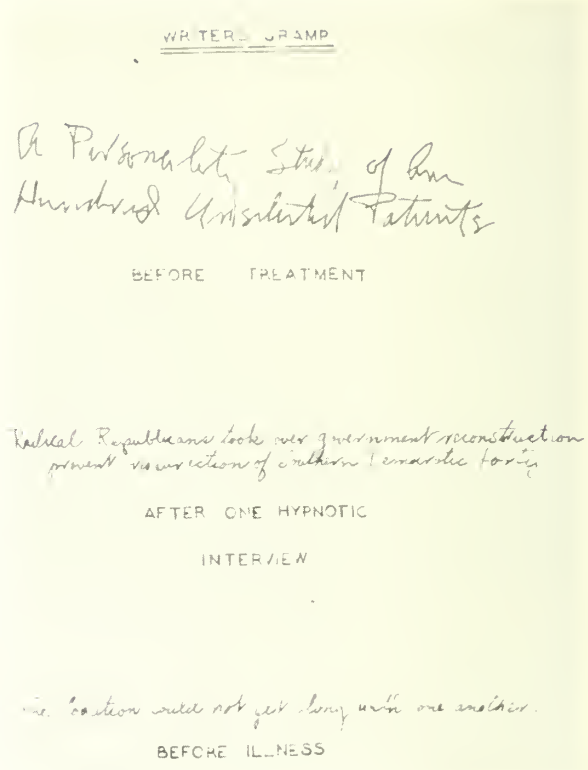
WRITERS CRAMP
A Personality Study of One Hundred Unselected Patients
BEFORE TREATMENT
Radical Republicans took over government reconstruction
[illegible]
AFTER ONE HYPNOTIC
INTERVIEW
[illegible] could not get along with one another.
BEFORE ILLNESS

Fig. 4. Examples of patient's writing with writer's cramp.

This patient had many conflicts in the psychosexual field. He also had, prior to the onset of his symptoms, trouble with his brothers and sisters in the settling of a small estate. At the time he and the rest of the family were not on speaking terms.

This patient unquestionably had some mild organic changes in his optic nerves. The changes, however, were not severe enough to account for the complaints.

Case No. 4: This case illustrates an organic illness with mental symptoms as the presenting feature. In addition the patient had a definite anxiety neurosis, the direct result of the original illness. (Group 3.)

A 28 year old married white female whose chief complaint was periodic charging sprees in the local stores,

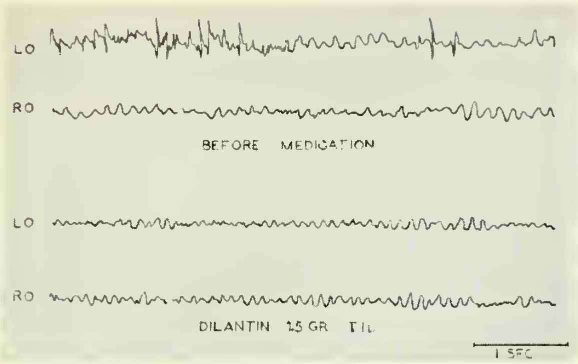

Fig. 5. EEG in psychomotor epilepsy.

frequently as much as $500.00 at one time. The merchandise was charged to friends. She also complained of daily headaches, severe nervousness and restlessness, recent moodiness and protracted periods of depression, weakness, momentary blackouts, and occasional lapses of memory. Her husband stated: "Sometimes she is neat as a pin and then she gets a little sloppy. She is really two different persons." The first symptoms made their appearance at the age of 18 years.

The past medical history was non-contributory. The physical and neurological examinations were negative. An electroencephalogram showed high voltage seizure discharges in the left occipital region and slow high voltage waves with positive deflection in all areas. (Fig. 5.)

A diagnosis of psychomotor epilepsy was made, and the patient was given dilantin with relief of the presenting complaint, as well as the secondary symptoms due to the anxiety. The electroencephalogram later showed no abnormalities.

Thus it can be seen that complete study of an individual is necessary in order to avoid diagnostic mistakes, ordering futile operations and scaring half to death many organically sound patients. There is only one way to reveal a neurosis and that is by knowing and understanding the individual as an individual in his reaction to complex life situations, excessive worries, and excessive strains.

13th Seminar on Industrial Medicine and Surgery

"New Ways to Help the Handicapped Worker" was the opening address of the Medical Seminar on Industrial Medicine and Surgery, which was held October 13th and 14th in Minneapolis. Dr. Joe R. Brown, Assistant Professor of Neuropsychiatry; Dr. Miland E. Knapp, Assistant Professor of Physical Medicine; and Dr. John H. Moe, Assistant Professor of Orthopedic Surgery, all of the University of Minnesota, joined Dr. Henry C. Marble, Consulting Surgeon of the Massachusetts General Hospital, Boston, in leading this discussion on Physical Medicine and Rehabilitation. This seminar, attended by more than 100 industrial physicians from Minnesota, Wisconsin, Iowa and South Dakota, was the thirteenth that has been conducted by the American Mutual Liability Insurance Company of Boston in principal cities throughout the country, and the first of its kind held in this area.

The Medical Seminar continued with discussions by Dr. Hewitt B. Hannah, Assistant Professor of Neuropsychiatry, University of Minnesota, on the Psychic Effect of Trauma; Dr. Wendall H. Hall, Chief of Bacteriology, Veterans Hospital, Fort Snelling, Minnesota, on Antibiotics in the Treatment of Infection; Dr. Robert F. McGandy, Chief Surgeon, Northern States Power Company, on the Treatment of Burns; and Dr. George A. Marks, Chief of Surgery, Winchester Hospital, Massachusetts, on Chronic Leg Ulcers.

The conference closed with a panel discussion on hand injuries, one of the most common results of industrial accidents, led by Dr. Marble; Dr. Harvey S. Allen, Chicago; and Dr. William D. White, Assistant Professor of Surgery, University of Minnesota.

Clinical Experiences with a New Antihistaminic Drug - Thephorin[*]

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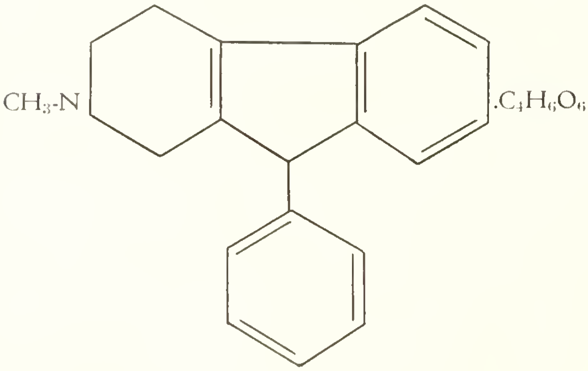
While the release of histamine or a histamine-like substance has not yet been proved conclusively to be the all-important factor in the production of allergic manifestations, the histamine theory was accepted by many investigators. Chemists have, therefore, sought for antihistaminic agents, some of which were found to be very effective in alleviating the symptoms of a diversified group of allergic conditions. In this country, Benadryl and Pyribenzamine were accepted widely by the medical profession. Most consistent results were reported to occur with these compounds in urticaria; but also in nasal allergies, a high percentage of cases was found to be benefited. Both drugs, however, give a high incidence of side reactions; another drawback is that their effect is only temporary.

The purpose of the present paper is to report on the results obtained with a new antihistaminic compound. The drug under consideration which was synthesized by Wenner and Plati,[1] is 2-methyl-9-phenyl-2,3,4,9-tetrahydro-1-pyridindene hydrogen tartrate. It was furnished by the manufacturer under the experimental designation NU-1504 and, as the study progressed, under the name of Thephorin.[*] Two medication forms were supplied: Tablets of 25 mg., and a palatable syrup containing 10 mg./4 cc. The following diagram portraying the structural formula of the substance shows that it is chemically not related to the other known antihistaminic agents.



THEPHORIN

The pharmacology of the compound was adequately described by Lehmann,[2] and several clinical investigators reported very gratifying results with the new drug in various allergic disorders. For instance, Reynolds and Horton[3] found 95 per cent of their hay fever cases to have benefited from Thephorin and 65 per cent of their patients with vasomotor rhinitis to have experienced "excellent results." McGavack et al.[4] reported benefit in 78 per cent of their hay fever patients. In urticaria the figure was 87.5 per cent and in bronchial asthma 20 per cent. According to Peters,[5] Thephorin was effective in relieving hay fever in 97 per cent of the cases, and was 75 per cent effective in all cases of asthma. Cohen et al.[6] reported benefit in 73 per cent of the 292 allergic patients to whom they administered Thephorin. The incidence of success in the cases of bronchial asthma was 69 per cent. Frank [7] observed relief of symptoms with Thephorin in 75 per cent of his cases. He obtained best results in allergic rhinitis of both the seasonal and non-seasonal variety with over 80 per cent of the patients being helped. In his asthmatic patients the incidence of improvement was 58 per cent. Paul and his collaborators [8] reported similar figures on the basis of a study comprising over 300 patients. Gelfand [9] reported improvement in 59 per cent of the bronchial asthma cases, but the incidence of success in his patients with nasal allergy was somewhat lower than that recorded by other students.

All these workers are agreed that Thephorin is distinguished by good tolerability and that its administration is very rarely attended by a depressant effect so commonly encountered with the other antihistaminic drugs. The acute toxicity of Thephorin was determined in essentially normal individuals by Boyd et al.[10]. They gave doses ranging from 75 to 600 mg. daily for periods of two weeks or more. In general, there were no appreciable changes in the hematological findings, blood pressure, pulse rate, electrocardiographic tracings, or urinalyses. When Thephorin was given in 75 mg. daily doses side effects were noted in 15 per cent of the cases, and at a 150 mg. daily dose level, the incidence of side effects was 24 per cent. The most commonly noted untoward reactions were dryness of the mouth and insomnia. Drowsiness was very uncommon, occurring in only 3 per cent of cases and at dosage levels of 300 mg. or more daily.

CASE MATERIAL, PROCEDURE AND RESULTS

Thephorin was used in the treatment of 113 patients of whom 61 presented themselves at the Department of Allergy of Gouverneur Hospital and 52 at the private office. There were 54 males and 59 females. The ages of the former ranged from 6 to 72 years and those of the latter from 4½ to 82 years. Table 1 lists the types of the various allergic manifestations encountered in the series studied. It appears that the 113 patients exhibited 168 allergic symptoms. The total daily dose in adults ranged from 30 mg. to 150 mg., and in children from

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[*] "Roche" brand of phenindamine, supplied through the courtesy of Dr. Leo A. Pirk, of Hoffmann-La Roche, Inc., Nutley, New Jersey.

Table 1

Clinical Diagnoses in 113 Patients Treated with Thephorin and Their Responses

Clinical Diagnosis	Number of Instances	Instances Showing Relief from Drug	Percent Relieved	Instances Not Relieved from Drug	Percent Not Relieved
Seasonal hay fever (early, middle and late types)	48	37	77.1%	11	22.9%
Bronchial asthma (seasonal and non-seasonal types)	45	26	57.8%	19	42.2%
Allergic vasomotor rhinitis	61	42	68.9%	19	31.1%
Cutaneous allergies (acute and chronic urticaria, atopic eczema and contact types of dermatoses)	12	11	91.7%	1	8.3%
Miscellaneous allergies	2	2	100.0%		
Total	168	118	70.2%	50	29.8%

20 mg. to 80 mg. The total daily doses were given in two to four equally divided portions and medication was continued over periods ranging from 1 day to 171 days.

As appears from Table 1, the incidence of success in the entire series was 70.2 per cent. In the various clinical diagnoses the percentage varied to some extent.

Disregarding the two instances grouped together under "miscellaneous allergies," best results were obtained in the cutaneous allergies with 91.7 per cent of the cases deriving benefit from the medication. Of the 48 instances with a diagnosis of seasonal hay fever, 37 showed relief, an incidence of 77.1 per cent. In the cases with non-seasonal vasomotor rhinitis the figure was 68.9 per cent and in bronchial asthma of the seasonal and non-seasonal type it was 57.8 per cent.

Side effects occurred in 37 patients, or 32.7 per cent. With several of these complaining of more than one reaction the total number of untoward effects was 47. As can be seen from Table 2, listing the side effects in their frequency distribution,* insomnia occurred 14 times, an incidence of 12.3 per cent, but only 5 patients or 4.4 per cent complained of drowsiness. Thus a stimulating effect was far more commonly encountered than a depressant action. The wakefulness Thephorin sometimes produced could be effectively counteracted by the use of a mild sedative-hypnotic.

Table 2

Frequency Distribution of Side Effects Occurring in 113 Patients Treated with Thephorin

Side Effects	Occurrence in No. of Cases
Insomnia	14
Irritability	5
Drowsiness	5
Dizziness	4
Slight respiratory distress	4
Weakness	3
Urinary retention	3
Nausea	3
Headache	2
Paresthesia of scalp	1
Constipation	1
Frequency of urination	1
Chills, tremors	1
Total	47

Comment

All workers in the field of allergy are agreed that the depressant effect of Benadryl, Pyribenzamine and a number of other antihistaminic drugs on the commercial market is only too frequently a handicap for their use. Particularly Benadryl is prone to produce drowsiness and allied toxic reactions. The administration of Thephorin is far less often attended by sedation and drowsiness than that of the other antihistaminics.

Thus, Thephorin is less likely to interfere with the patient's activities and duties. Obviously, this is of particular advantage in cases requiring antihistaminic medication over a prolonged period of time.

The percentages of success attained with Thephorin in nasal allergies, both the seasonal and perennial variety, and in cutaneous allergies, equal approximately those observed by the author following the administration of Benadryl or Pyribenzamine. In the treatment of bronchial asthma, however, the experimental drug seems to be distinguished by greater effectiveness.

The action of Thephorin is purely palliative as is that of other drugs used in the treatment of allergic conditions, such as epinephrine, ephedrine, aminophylline and the histamine antagonists previously established. Consequently, with all these agents, control of symptoms is only temporary.

The good tolerability of Thephorin, evidenced by a low incidence of side effects, particularly the comparative absence of drowsiness and mental sluggishness, appears to be a very attractive feature of the drug.

Summary and Conclusions

A new antihistaminic drug 2-methyl-9-phenyl-2,3,4,9-tetrahydro-1-pyridindene hydrogen tartrate (Thephorin), was evaluated clinically in 113 allergic patients. The results obtained are presented in tabulated form.

The depressant effect so frequently encountered by patients receiving the other histamine antagonists was far less frequently observed by persons taking Thephorin. The wakefulness it sometimes produces can be effectively counteracted by the use of a mild sedative-hypnotic.

None of the antihistaminics has a curative action and none of them must be looked upon as a substitute for the usual procedures in the therapy of allergy. As with the other drugs, the relief obtained with Thephorin lasts only for several hours. In conclusion, Thephorin deserves a definite place in the management of allergic disorders.

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*Dr. H. Gelfand collaborated in the evaluation of the side effects presented.

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SLICHTER RESEARCH PROFESSORSHIP

The announcement has been made by the University of Wisconsin Dean of the Medical School, Dr. Wm. S. Middleton, that Dr. Clinton N. Woolsey of the Johns Hopkins University School of Medicine in Baltimore has been appointed to the recently created Chair, the Slichter Research Professorship of Physiology at the Wisconsin Medical School.

Dr. Woolsey's particular area of investigation has been the field of neurological research in physiology, and his contributions to the scientific literature have been very extensive.

The Wisconsin Alumni Research Foundation established the Charles Sumner Slichter Research Professorship in the Natural Sciences in memory of the late Professor Charles Sumner Slichter. Dr. Woolsey is the first appointee to that Chair.

DERMATOLOGY AND SYPHILOLOGY MEETING

The seventh annual meeting of the American Academy of Dermatology and Syphilology will be held in Chicago from Saturday, December 4, through Thursday, December 9.

A.P.H.A. MEETING

The 76th annual meeting of the American Public Health Association will be held November 8-12, 1948, in Boston.

AMA INTERIM MEETING

The second AMA Interim Meeting will be held in St. Louis, Missouri, November 30 to noon December 3, 1948.

As was the case last year in Cleveland, the scientific program of the Interim Session is planned especially for general practitioners. A wide variety of clinical conferences and exhibits of clinical and pathological material will be correlated with the lecture meetings.

AMERICAN ASSOCIATION OF RAILWAY SURGEONS CONVENTION

The American Association of Railway Surgeons will commemorate the 60th year of its foundation at a three day national convention in Chicago, Nov. 21-23, at the scene of its first meeting.

Dr. James E. M. Thomson, president, of Lincoln, Nebraska, will address the dinner session on "Recent Observations of Medicine in Central Europe." The sessions, for which there is no registration fee, are open to all members of the medical profession.

The Use and Misuse of Streptomycin in the Treatment of Tuberculosis

Karl H. Pfuetze, M.D., and Marjorie M. Pyle, M.D.
Cannon Falls, Minnesota

Streptomycin was first used in the treatment of tuberculosis of human beings at the Mayo Clinic in the fall of 1944, after extensive animal experiments by Feldman and Hinshaw[1] in which the antibiotic caused striking suppression of well-established tuberculosis in guinea pigs. At Mineral Springs Sanatorium we have been collaborating with Drs. Hinshaw and Feldman for several years in a program of research on the chemical and antibiotic therapy of tuberculosis. We are fortunate, therefore, in having had more than three years of experience in the use of streptomycin for the treatment of tuberculosis in human beings and more than seven years of experience with the sulfones.

Recognition of the efficacy of streptomycin in the treatment of tuberculosis and realization of the limitations of this form of treatment came almost simultaneously. These limitations are due to the innate nature of tuberculosis and the mode of action of the antibiotic. The complexity of tuberculosis does not need to be emphasized. The extent to which tuberculous processes may be reversed varies with the site and type of lesion, and not all lesions are curable. Furthermore, like other antibiotic agents, streptomycin is chiefly bacteriostatic rather than bactericidal, at least in the doses used clinically. Its suppressive effect on tuberculous infections is limited potentially by the fact that after exposure to the drug for weeks or months, strains of resistant bacilli frequently appear.

Another factor limiting the usefulness of streptomycin is the potential toxicity of the drug. Although this is not sufficient to preclude treatment with streptomycin in any case in which it is really indicated, it is sufficient to prohibit indiscriminate use of the drug.

In order that streptomycin may be used intelligently, all of these factors must be considered separately and together. The exact place of streptomycin in the treatment of tuberculosis cannot be defined as yet. However, it has become manifest that in some forms of the disease streptomycin is the only treatment available or is the treatment of choice, alone or in combination with other procedures; in other forms of tuberculosis its use is problematical or of doubtful value, and in some forms of the disease or in some clinical conditions its use probably is contraindicated.

Indications for Treatment with Streptomycin

The unique ability of streptomycin to bring about remission in disseminated tuberculosis is incontestible proof of the effectiveness of the drug against the tubercle bacillus. It is true that in the majority of cases of tuberculous meningitis in which the disease seemed to be arrested by treatment with streptomycin, reactivation has occurred later. However, the state of remission is often prolonged, and a few patients treated at the Mayo Clinic are alive and apparently well nearly two years after cessation of such treatment. In generalized miliary tuberculosis without meningeal involvement, the percentage of possible cures is considerably higher, and in view of the uniformly fatal nature of disseminated tuberculosis, the use of streptomycin is indicated in every case until treatment of more certain effectiveness is available. Patients having tuberculous meningitis who have responded best to treatment received the drug both intrathecally and intramuscularly in large doses.

Almost without exception, ulcerating and granulomatous lesions of the oropharynx, larynx, and tracheobronchial tree have healed within a few weeks when streptomycin was administered, and there have been very few recurrences as long as three years later. If this were the sole accomplishment of streptomycin, it still would have a valued place in the therapeutic armamentarium of tuberculosis. In the early investigations patients having such lesions received streptomycin both intramuscularly and by means of nebulization. It has been found that nebulization alone is relatively ineffective. Whether combined therapy is superior to intramuscular administration alone has not been demonstrated conclusively.

Cutaneous sinuses originating in tuberculous foci constitute another category in which streptomycin, administered intramuscularly, has been used with signal success. Arthrodesis and spinal fusion have been carried out successfully after healing of sinuses originating in bone. In a series of cases of tuberculosis of bones and joints treated with streptomycin at the Mayo Clinic and at Mineral Springs Sanatorium,[2] results have been excellent in approximately half the cases. In addition to closing of sinuses and subsidence of symptoms there may be roentgenographic evidence of recalcification.

Tuberculous enteritis and peritonitis have responded well to parenteral administration of streptomycin. Symptoms usually subside rapidly. Ascitic fluid which may be present tends to disappear. In enteritis there may be roentgenographic evidence of healing of ulcerated regions.

In genito-urinary tuberculosis treatment with streptomycin may effect pronounced and often prolonged palliation of symptoms, and there may be cystoscopic evidence of healing of tuberculous cystitis. Bacilluria is usually markedly reduced; in many cases the urine temporarily becomes negative for tubercle bacilli, and in a small proportion of cases it has not been possible to recover tubercle bacilli from the urine by culture as long as two years after cessation of treatment. However, in renal tuberculosis, the use of streptomycin should be restricted to cases in which bilateral involvement has occurred or a solitary kidney is involved. When both kidneys are present and only one is proved to be infected, streptomycin should not be substituted for nephrectomy although it may prove to be of value in conjunction with surgery.

In several tuberculous conditions the results of treatment with streptomycin have been uncertain or disappointing, so that although a trial of streptomycin may be worth while it is not specifically recommended at this time. Use of streptomycin usually effects improvement in tuberculous lymphadenitis but may not be the treatment of choice except in the presence of draining sinuses. Lupus vulgaris occasionally has shown remarkable improvement from streptomycin, but for the most part any benefit noted in cutaneous tuberculosis tends to be temporary. Tuberculoma of the brain probably is unaffected by treatment with streptomycin, since assays made at necropsy indicate that streptomycin does not penetrate brain tissue. As a rule, tuberculous pericarditis evidently does not yield to treatment with streptomycin. Only in a few cases has streptomycin been beneficial in tuberculous empyema, whether the drug was administered intramuscularly, intrapleurally, or by both methods.

USE OF STREPTOMYCIN IN PULMONARY TUBERCULOSIS

It is in pulmonary tuberculosis that the greatest diversity of pathologic changes occurs, the greatest differences in host-parasite relationship and consequently the greatest disparity in results from all types of therapy, including treatment with streptomycin. Therefore, it is in this largest division of tuberculosis in which clinical judgment is most necessary. The problem is simplified if it is remembered that streptomyicn has only a suppressive effect and that in pulmonary tuberculosis it probably should be used only in cases in which suppression of the disease for a limited period of time will be of benefit in the long run.

As expected, the exudative type of pulmonary lesion responds best to treatment with streptomycin, and often there is a marked degree of clearing roentgenographically, regardless of the original extent of the lesion. Cavities associated with exudative disease usually become smaller, especially if they are thin-walled or of recent origin, and they sometimes are lost to view in serial roentgenograms during or after treatment. Most proliferative lesions show some degree of improvement, but seldom is there any significant or permanent improvement in chronic fibrocaseous disease. The destructive changes of such disease tend to be irreversible.

In treating pulmonary tuberculosis with streptomycin, it is especially important not only to make the proper selection of patients but also to treat them at the right time and for the optimal length of time. Any patient who has become worse or whose condition has remained stationary with previous treatment, or any patient who has acute disease with symptoms of toxemia may be a logical candidate for treatment with streptomycin. It is well, however, to be prepared to follow this treatment with some other form of treatment in order to consolidate the gains of an artificially induced remission. When the patient's own powers of defense appear to be adequate, extended rest may be sufficient. In other cases, for example, when significant cavitation is present, collapse therapy or pulmonary resection may be indicated. When collapse therapy or resection is planned, it is important that the procedure be instituted at the optimal time, that is, when the patient has received appreciable benefit from treatment with streptomycin but before bacterial resistance has appeared.

In our experience the majority of patients who have improved materially during treatment with streptomycin have proceeded to a state of arrest afterward, and the percentage of reactivations has been no larger than in any series of arrested cases. As yet there is no evidence that treatment with streptomycin interferes with the development of maintenance of normal defense mechanisms.

The advent of streptomycin has greatly increased possibilities for the surgical treatment of pulmonary tuberculosis. When unstable lesions, especially in the contralateral lung, can be brought under control by its use, thoracoplasty often becomes possible. Even when there is no significant component of exudative disease, the patient's status may improve during treatment with streptomycin because of reduction in cough, improvement in appetite, and so forth, so that he becomes a more favorable candidate for thoracoplasty. However, it is not suggested at this time that prophylactic courses of streptomycin be given routinely for thoracoplasty.

In our experience the hazards of pulmonary resection are reduced considerably by treatment with streptomycin. It is necessary that the course of preoperative treatment be relatively brief to ensure persistence of the suppressive effect of streptomycin in the period of postoperative treatment when danger of extension of disease and reactivation of foci of infection is great. This precaution is necessary because of the phenomenon of bacterial resistance, a problem which ramifies into all phases of chemotherapy.

BACTERIAL RESISTANCE

It is our opinion that the appearance of bacterial resistance to streptomycin in vivo has the same significance that it does in vitro. Clinical evidence is accumulating to prove that when a patient's strain of tubercle bacilli is resistant to streptomycin, no benefit can be expected from further treatment with the drug. It is most important, therefore, to use this valuable weapon when it is most needed and only for as long as it continues to be helpful.

Although the mechanism of bacterial resistance is not known, there is some evidence that the factors of genetic variation and selection are of prime importance. From cultures of patients' sputa made before, during, and after treatment with streptomycin, it has been found that a few organisms are naturally resistant to streptomycin.[3] During treatment with streptomycin these organisms increase in number and in their degree of resistance until eventually the population of tubercle bacilli, originally predominantly sensitive, is predominantly resistant.

Although the increase in resistance may begin almost immediately it does not appear to be complete for from six to sixteen weeks. Data available at present indicate that bacterial resistance occurs in approximately three-fourths of the patients treated with streptomycin for a period of 120 days. A few strains have not lost their sensitivity when treatment was continued for six months. Although in a few cases resistant strains have been replaced by sensitive strains when treatment with streptomycin was discontinued, most strains appear to retain their resistance. In one case in our series, tubercle bacilli resistant to 3,000 mg. of streptomycin per milliliter of medium can be recovered from the patient twenty-seven months after completion of treatment with streptomycin for 100 days.

Possibilities for Misuse of Streptomycin

The misuse of streptomycin arises as a corollary to the use of streptomycin. Some of the ways in which the antibiotic may be used injudiciously have been implied in the preceding discussion.

Because of the potential toxicity of the drug and because of the undesirability of replacing drug-sensitive strains of tubercle bacilli with drug-resistant strains, streptomycin probably should not be used in any case in which the patient can be expected to recover if the usual methods of treatment only are employed. Hence we believe it should not be used in minimal pulmonary tuberculosis or in most cases of moderately advanced tuberculosis as long as it remains under control. In the small series of cases of minimal tuberculosis in which treatment with streptomycin has been used, it would be difficult to prove any acceleration of the healing process. But even if the immediate results were excellent, it must be remembered that viable tubercle bacilli often remain in arrested lesions indefinitely. If these bacilli are resistant to streptomyicn, the patient may be deprived of valuable, perhaps lifesaving therapy, should a more serious form of tuberculosis develop at a later time.

Likewise it probably is unwise to use streptomycin in chronic fibrocaseous or fibrocavernous disease except in conjunction with surgical procedures, as discussed previously. The sputum in such cases can be expected to remain positive for tubercle bacilli, and there is danger of dissemination of bacilli resistant to streptomycin. Any person infected with these bacilli probably will be just as refractory to treatment with streptomycin as the original patient.

It may prove to be advisable to make especially stringent qualifications for the use of streptomycin in the treatment of patients who are more than 45 or 50 years of age. The disturbance in equilibrium which has often occurred during treatment with streptomycin is due to decrease or loss of vestibular function, a loss which apparently is permanent. Most young individuals soon learn to compensate for the loss of vestibular function by using accessory balance mechanisms. But in older patients recovery of equilibrium is slower and some degree of disability may be permanent.

The toxicity of streptomycin has been reported in detail in previous articles,[4,5] so it will be discussed here chiefly in relation to dosage. In retrospect, many of the patients treated with streptomycin during the early investigations received larger doses and were treated for longer periods than may have been necessary or advisable. The incidence of toxic manifestations, particularly of damage to the eighth cranial nerve, has been much higher with doses of 2 gm. or more a day than with comparatively small doses. Evidence of serious toxicity occurred in only 4 of a series of 28 patients, who received 1 gm. a day for sixty to 120 days.[6] A marked degree of compensation developed in these cases later.

Logically the dosage should be adjusted to body weight, and a study to determine the optimal dose on this basis is in progress. To date it appears that in most forms of tuberculosis relatively small doses of streptomycin may be used with increased safety and without sacrificing any therapeutic effect. There is also evidence that results of treatment with a given daily dose are comparable whether the total amount of streptomycin is divided into two doses given at intervals of twelve hours or whether it is divided into smaller doses given at more frequent intervals. In fact, it may be found that results are satisfactory when the entire daily dose is given in one injection.

When a patient's renal function is below normal, it is advisable to give streptomycin with caution and only after review of the need for this form of treatment. The dosage should be adjusted to the blood levels of streptomycin, which are likely to be inordinately high with the attendant danger of toxic reactions. In the experience of most investigators, permanent renal damage attributable to treatment with streptomycin has occurred only among patients who had a significant degree of damage previously.

It is obvious that streptomycin should be administered only under strict observation in institutions in which adequate laboratory facilities are available. It goes without saying that there must be no self-medication on the part of patients. Furthermore, it is not advisable for physicians inexperienced in the therapy of tuberculosis to undertake the treatment of patients with streptomycin. Tuberculosis potentially is a deadly disease and demands all the resources of the trained phthisiologist. The advent of antibiotic treatment has not changed this fact.

That treatment with streptomycin is no substitute for care in a sanatorium and rest in bed has been emphasized repeatedly. Healing of tuberculous lesions occurs by natural processes, whatever method or methods have been used to facilitate remission. Rest in bed should be of the same degree during and following treatment with streptomycin as would be prescribed in any case of similar status. In addition, return to activity should be just as graduated.

Summary

Clinically, as well as in the laboratory, streptomycin has proved to have a unique suppressive effect on tuberculous infections. In the last three and a half years

much has been learned of the indications and contraindications for treatment with this antibiotic. Some of the chief indications for the use of streptomycin in tuberculosis include disseminated tuberculosis, tuberculous cutaneous sinuses, tuberculosis of the oropharynx, larynx, and tracheobronchial tree, and tuberculous enteritis and peritonitis. In the treatment of pulmonary tuberculosis streptomycin is a valuable adjunct when it is used judiciously. Streptomycin may be misused in respect to selection of cases and probably in respect to dosage and duration of treatment. The usefulness of streptomycin is limited by the potential toxicity of the drug, by the problem of bacterial resistance, and by the fact that not all tuberculous lesions are curable by natural processes of healing. Because of the phenomenon of bacterial resistance the period of effective treatment with streptomycin is variable and unpredictable; it probably ranges from one to several months. In the treatment of tuberculosis it is most important to use streptomycin in the right case, at the right time, and for the optimal length of time as nearly as this can be determined.

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Tuberculosis Among College Students

Sixteenth Annual Report of the Tuberculosis Committee, American Student Health Association, for the Academic Year, 1945-1946

Modern tuberculosis case-finding techniques are productive of important, instructive and often startling results. Especially is this true when these techniques are applied to groups of apparently healthy people. Active and communicable cases of tuberculosis are not infrequently found where otherwise there would be no evidence that anything was amiss. And, fortunately, the majority of cases discovered by these methods are either in an early or a minimal stage of the disease, when chance for rapid, complete recovery is best.

To no other population group are the above statements of more importance than to college students. These young men and women are notoriously at the highest level of health, strength and vigor. From their ranks are recruited leaders for the various fields of human endeavor, literature, art, science, athletics and of recent outstanding importance, even war. But from their ranks are also recruited many cases of tuberculosis. Too frequently the disease is discovered despite the healthful appearance of the victim.

It is of utmost importance that these young people be given the opportunity to have determined their status regarding tuberculosis. As a general rule, the earlier in its course the disease is discovered, the less time it will take for recovery to the point where an active place in society may again be resumed. When the diagnosis is made before typical symptoms are present, a further advantage is gained for at this time the disease is less likely to be communicable.

TABLE 1

Number and Percentage of American Colleges and Universities Which Answered Questionnaire and Percentage of Those Answering Which Reported Programs, Classified by Academic Year

Academic Year Ending June 30	Colleges Sent Questionnaires	Replies Received		Colleges Which Reported Programs	
		Number	Per Cent of Colleges Sent Questionnaires	Number	Per Cent of Replies Received
1947	885	311	35.1	259	83.2
1946	883	507	57.4	362	71.4
1945	885	461	52.1	312	67.7
1944	886	400	45.1	286	71.5
1943	879	398	45.3	267	67.1
1942	850	488	56.7	311	63.7
1941	854	483	56.6	304	62.9

Note: Although the number and percentage of replies received were smaller, and the number of programs smaller, the percentage of programs increased. This may be due to the fact that some colleges did not answer because they had no program.

For seventeen years the Tuberculosis Committee has been promoting, with considerable success, interest in this problem among the institutions of learning in the United States. For more than ten of these years, over 800 colleges and universities have been circularized annually with information about the potential seriousness of tuberculosis to the individual who is a victim of the disease, and to his associates. All colleges have repeatedly been urged to develop a tuberculosis-control program, and many have, although resistance has been met for several reasons. Because of its very nature, tuberculosis is not generally recognized as a serious threat to the health of students. Perhaps thinking in terms of "consumption," colleges have reported that "no case was ever known to have existed" on their campus. In some instances colleges have been unable to develop programs because of limitations in resources.

However, the campaign to stimulate interest in tuberculosis-control programs has produced results. As a matter of record, the curve of college participation has shown an almost constant upward trend.[1] The number of colleges reporting programs increased from 6 in 1932 to 362 in 1946. There have been times when this upward trend was interrupted, it is true. For instance, following the economic depression in 1936, and again in 1943, when many health services were forced to curtail their activities because of the war, there was a reduction in number of programs reported. But the curve began to rise again in 1944.

For reasons that are not entirely clear, the 1947 returns once more show fewer programs reported. Each of the 885 institutions to which a questionnaire was sent was asked to answer as many of the questions as possible, and to return the questionnaire, regardless of whether an organized program for tuberculosis control was carried out on their campus or not. Only 311 replies were received, of which 259 reported a program (Table 1). It is possible that a few questionnaires may have been lost since it was necessary for some of them to go through the mails two or three times before finally arriving at the laboratory where they were processed. There is also a possibility that certain post-war adjustments known to have forced curtailment of activity in some health services may have affected a much larger number. Whatever the cause, the Committee trusts that the effect will be temporary.

Lessened returns have not denied us the opportunity to point out that many cases of tuberculosis are discovered among college students. And once again, the ma-

TABLE 2

Cases of Tuberculosis Found in Colleges with Tuberculin Testing Programs, in Those with X-ray Programs Only, and in Those with No Tuberculosis Programs, Classified by College Group and Disposition of Cases

College Group and Disposition of Cases	Cases found in 105 colleges with tuberculin testing programs (enrollment 360599)	Cases found in 154 colleges with basic X-ray programs (enrollment 345158)	Cases found in 52 colleges with no tuberculosis programs (enrollment 73740)
Cases found in student body	291	339	9
* Cases about which no further information was reported	123	177	0
**Students who were reported as having withdrawn from college	168	162	9
Believed to have entered sanatoria	108	115	7
Believed to be under treatment at home	36	23	2
Details not reported	24	24	0
Faculty and administrative staff	10	15	2
College food handlers	9	18	1
Other college employees	5	22	0
Students now back in college with arrested disease	284	280	26

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*One institution, for example, reported 99 cases discovered, but indicated disposition of only 28 cases—22 going to the sanitarium, 4 to their own homes, 1 on whom details are unavailable, and 1 case went to Arizona.

**There were some instances where no cases were reported as having been discovered, but students had withdrawn from college. The evidence indicated that in some instances the diagnosis had been made by outside physicians.

TABLE 3

Colleges Sent Questionnaire, Replies Received and Programs Reported in the Questionnaire Survey of American Colleges and Universities, Classified by Division and State: Year Ending June 30, 1947

Division and State	Colleges sent Questionnaire	Replies received	Programs reported	Annual increase (+) or decrease (—) in programs reported
United States	885	311	259	—103
New England	85	40	32	— 10
Maine	8	4	3	— 1
New Hampshire	7	4	3	— 1
Vermont	9	4	4	—
Massachusetts	43	18	13	— 6
Rhode Island	6	5	4	—
Connecticut	12	5	5	— 2
Middle Atlantic	150	58	50	— 21
New York	69	23	18	— 15
New Jersey	18	9	9	— 2
Pennsylvania	63	26	23	— 4
East North Central	170	72	62	— 25
Ohio	46	16	14	— 7
Indiana	27	11	11	— 5
Illinois	45	14	12	— 10
Michigan	25	13	10	—
Wisconsin	27	18	15	— 3
West North Central	127	48	40	— 17
Minnesota	22	10	10	— 9
Iowa	26	10	6	— 2
Missouri	25	12	10	+ 1
North Dakota	9	4	3	— 2
South Dakota	8	2	2	+ 1
Nebraska	16	5	4	— 1
Kansas	21	5	5	— 5
South Atlantic	118	27	21	— 20
Delaware	1	0	0	—
Maryland	16	2	2	— 2
Dist. of Columbia	9	1	1	— 3
Virginia	18	4	4	— 3
West Virginia	14	5	4	— 5
North Carolina	22	7	5	— 2
South Carolina	15	4	3	— 2
Georgia	16	3	2	— 1
Florida	7	1	0	— 2
East South Central	66	13	8	— 2
Kentucky	17	3	2	— 2
Tennessee	27	5	2	—
Alabama	13	3	3	+ 2
Mississippi	9	2	1	— 2
West South Central	72	14	12	—
Arkansas	11	3	3	— 1
Louisiana	13	2	2	—
Oklahoma	16	4	3	—
Texas	32	5	4	+ 1
Mountain	32	9	8	— 3
Montana	6	2	2	—
Idaho	3	1	1	—
Wyoming	1	1	1	—
Colorado	9	2	2	— 2
New Mexico	5	0	0	—
Arizona	3	1	1	— 1
Utah	4	1	0	—
Nevada	1	1	1	—
Pacific	65	30	26	— 5
Washington	16	4	3	— 2
Oregon	14	8	7	— 2
California	35	18	16	— 1

Note: Annual increase or decrease in programs reported determined by comparison with 1945-1946 report.

jority of these cases are found at colleges which are especially equipped to look for the disease. The total number of cases, presumably of the "re-infection" type, reported for 1946-47 was 630, and all but nine were found at colleges having definite anti-tuberculosis programs. Without these programs our colleges simply do not find the cases which, at least statistically, must be among their students (Table 2).

A large number of arrested cases of tuberculosis were again permitted to resume their college work. In 1946-47 there were 590 of these students reported enrolled. We believe it important to take yearly note of these fortunate people. They are concrete evidence of the fact that "they *do* come back."

Colleges in every geographical division and in all but two individual states reported programs (Table 3). This enables the Committee to continue reporting the incidence of tuberculous infection among young people of college age (Tables 4 and 5). Although it is difficult to make year-to-year comparisons of these data, over the years the information may be of value as an estimate of the effect of tuberculosis-control programs the country over. The number of infected individuals is an index of the extent of open disease.

Although thousands of veterans are still enrolled in colleges, they are apparently losing their specific identity. Only an occasional report mentioned them as creating a special tuberculosis problem. Evidently their numbers simply added to the totals submitted, the same as any student.

Of course, that is as it should be. The Tuberculosis Committee has always stressed the importance of having *all* students examined annually for tuberculosis, and has been reluctant to point to any special group as being more in need of survey than another. However, it must be borne in mind, particularly at colleges where a compelte annual survey of all students can not be carried out, that tuberculosis is prone to develop more frequently in certain groups, and under certain circum-

TABLE 4

Male and Female Students Tested in 91 Colleges and Number and Percentage of Reactors, Classified by Technique Used: Year Ending June 30, 1947

Technique Used	Students tested in 91 colleges			Reactors					
				Number			Per cent of total		
	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
All techniques	105,633	60,263	29,819	20,073	13,598	2,809	19.0	22.6	9.4
Patch Test	8,684	5,671	1,968	1,594	1,228	209	18.6	21.7	10.6
P.P.D.									
Two Dose	11,529	7,424	4,115	3,433	2,846	956	29.7	38.3	23.2
Single and other Dosage	36,089	19,088	8,691	6,534	4,017	1,114	18.1	21.1	12.8
Old Tuberculin									
Two Dose	5,813	3,318	1,098	1,023	792	173	17.6	24.0	15.8
Single and other Dosage	33,164	17,217	11,377	5,602	3,098	1,107	16.9	18.0	9.7
Combined (Any combination of above)	10,384	7,545	2,570	1,887	1,617	250	18.2	21.4	9.7

NOTE: 105 Colleges reported tuberculin-testing programs but data from 14 institutions were incomplete.

TABLE 5

Male and Female Students Tested in 105 Colleges and Number and Percentage of Reactors, Classified by Geographical Division: Year Ending June 30, 1947

Geographical Division	Students tested			Reactors					
				Number			Per cent of total		
	Both Sexes*	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
United States	111,443	59,588	32,088	20,779	13,346	3,954	18.6	22.3	12.3
New England	3.914	2,700	1,214	1,227	931	196	31.3	34.5	16.1
Middle Atlantic	12,752	8,457	3,317	2,525	2,245	280	19.8	26.5	8.4
East North Central	33,604	17,039	7,882	6,233	4,046	954	18.5	23.7	12.1
West North Central	31,461	14,512	8,352	5,418	2,689	906	17.2	18.5	10.8
South Atlantic	6,271	3,982	2,279	1,257	877	323	20.0	22.0	14.2
East South Central†	958	382	576	105	61	44	11.0	16.0	7.6
West South Central	3,551	1,400	2,151	377	194	183	10.6	13.9	8.5
Mountain	10,181	6,735	2,206	1,218	848	124	12.0	12.6	5.6
Pacific	8,751	4,381	4,111	2,419	1,455	944	27.6	33.2	23.0

*Total for both sexes does not check. In some instances the breakdown by sex was not given.

†Only one college representing this section.

stances. Veterans are more frequently infected, and more of them may therefore develop the disease. They are of a slightly older age group and, in addition, many were stationed in parts of the world where the disease was rampant. Athletes should also be given special consideration because of the stress and strain of training and competition. Medical and nursing students have a higher exposure rate than most others and should therefore be examined with greater frequency.

SUMMARY OF PROGRAMS REPORTED

Past committee reports have summarized tuberculosis-control programs under two main headings: (1) those where the tuberculin test was used as the initial screening method, followed by x-ray of reactors; (2) those where the x-ray alone was used.

The same general plan was followed for 1946-47, but classification of some of the reported programs proved to be a difficult task. In fact, the statistician was frequently at a loss to decide if some of the data submitted justified its inclusion in *any* program! We hesitate to mention this because we are grateful to every one who answered a questionnaire. It would help a great deal, however, if all questions were completely answered, insofar as possible. One gets the impression that enrollments at some colleges are a carefully guarded secret, especially when it comes to breaking down of the totals into male and female. In the opinion of the Committee, these annual surveys of the incidence of tuberculous infection and tuberculous disease in an appreciable segment of the nation's youth constitute a major Health Service contribution to society in general. "Whatever is worth doing at all is worth doing well."

1. *Programs Employing the Tuberculin Test and X-ray of Reactors—*

Colleges depending primarily upon the tuberculin test as their initial screening method numbered 105 (Table 6). Based on adequacy of data submitted, apparent proportion of student body tested and number of reactors x-rayed, 24 programs were roughly classified as "excellent," 34 as "good", 33 as "fair" and 14 as "poor".

Without question, a college has an "excellent" program when entering students are tuberculin tested and reactors among them x-rayed, and when, each year, upper classmen non-reactors are retested and reactors re-x-rayed. If the report is made that all Freshmen are tested and all Freshmen reactors are x-rayed, the pro-

TABLE 6

Techniques Used in Tuberculosis Testing in 105 Colleges, Showing Number of Cases Using Each Technique

Testing Method:		
Mantoux Intradermal	69	colleges
Vollmer Patch Test	17	"
Combination Mantoux	5	"
Not reported	14	"
Testing Material:		
Purified Protein Derivative	43	"
Old Tuberculin	32	"
Not specified	30	"
Testing Dosage:		
Two-dose Technique	18	"
Single Dose *	52	"
Not specified	35	"

* The "single dose" varied when either P.P.D. or O.T. was used. Some used either the first or the second strength, only. Others used a variety of "intermediate" doses.

gram may be good, but it is certainly not inclusive enough to produce a tuberculosis-free student body. The same may be said for other variations which exclude one student group or another from either the test or the x-ray, whichever may be indicated by previous testing results. On many occasions an upperclassman who was a non-reactor as a Freshman, has changed to a state of reaction in his Sophomore, Junior or Senior year. Calling them "converters", Hilleboe[2] warned that special scrutiny, extending over a period of several years, should be given these new reactors.

In recent years an increasing number of colleges have reported the use of both the tuberculin test and the chest x-ray for all entering students. Recognizing the value of this combined procedure, the Committee has recommended that it be employed wherever facilities permit. However, for such a program to be rated as "excellent", it would be necessary that all non-reacting upperclassmen be retested and all reactors x-rayed, annually.[3]

For better results, and to insure greater uniformity, tuberculin testing should be done intradermally (Mantoux), using Purified Protein Derivative of tuberculin (P.P.D.). This material is give in two strengths. The first dose, prepared according to directions that accompany the material, is 0.00002 milligrams. If no reaction occurs after 72 hours a second dose of 0.005 milligrams is given. When no reaction follows the second dose, the individual tested may be recorded as free from tuberculous infection.*

Quite the same uniformity and accuracy of results may be obtained if Old Tuberculin (O.T.) is used in place of the more expensive P.P.D. Preferably, Old Tuberculin is also given in two strengths. The first dose, injected intradermally, is 0.1 mgm. When no reaction occurs after seventy-two hours a second dose of 1.0 mgm. is given. Failure to react to the second dose may also be taken as evidence of freedom from tuberculous infection.

Colleges report a variety of modifications of these preferred techniques, and some of the modifications have been reported elsewhere.[3] This is another of those instances where each college must adapt a tuberculosis-control program to its own particular facilities.

2. *Programs Employing the X-ray Alone as a Screen*—

Classifying them on a basis similar to that used for tuberculin-testing programs, of the 154 colleges (Table 7) using the x-ray alone, 41 were considered to have an "excellent" program, 48 a "good" program, 54 "fair" and 11 "poor".

TABLE 7

Techniques Used in Basic X-ray Programs, Showing Number of Colleges Using Each Technique

X-ray routines reported:	No. of Colleges
Total	154
X-ray reported, but routine not reported	63
All students	24
All students annually	19
New students	22
New students and questionable cases	1
*New students and special groups	3
New students and seniors annually	11
Seniors	1
X-ray optional	10

*Medical students, etc.

The main criterion for an excellent program was that all students were x-rayed annually. When this is done, most of the significant cases of tuberculosis will be brought to light. Less than this will almost certainly result in unsuspected cases being missed for a longer time than is necessary. When one of the better types of program is used, it should rarely be necessary for a student with tuberculosis to wait until symptoms have developed before his case is discovered. Because of the protean nature of the disease we must constantly be on our guard against it, but a Health Service with a "good" to "excellent" program should be relatively free from the danger of *student* tuberculosis.

Forty-seven colleges, distributed over 23 states, indicated that part or all of their x-ray program had been conducted by either the local tuberculosis association or one of the official health departments. This was particularly true of the smaller colleges. Any college, large or small, if finding it difficult to develop a program, would do well to investigate the possibility of obtaining assistance from one of these agencies. It even appears that the relative increase of x-ray programs over tuberculin-testing programs may be due to the wider availability of photo-fluorographic units. Many health departments and tuberculosis associations now have them.

While in no position to deny the value of the x-ray alone as a tuberculosis case-finding procedure, the Committee again calls attention to some of its limitations. The x-ray gives no certain proof of tuberculous infection, or of tuberculous disease for that matter. Diagnosis may be made only after careful clinical study of a suspected case. And in recent years it has been quite convincingly demonstrated that calcifications noted on chest films are not always proof of previous tuberculous infection. Many diagnoses of "healed childhood tuberculosis" have undoubtedly been made when the true

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*See "Diagnostic Standards," available from N.T.A., for further information on tuberculin testing techniques.

TABLE 8

Number and Percentage of American Colleges and Universities Which Answered the Questionnaire and Which Reported Programs, Classified by Student Enrollment: Years Ending June 30, 1945-46 and 1946-47

Student Enrollment	Colleges Reporting 1946-47			Colleges Reporting 1945-46		
	Total	With Programs		Total	With Programs	
		Number	Per Cent of Total		Number	Per Cent of Total
All colleges	311	259	83.2	507	362	71.4
Colleges with:						
Fewer than 500 students	71	56	78.9	241	148	61.4
500 but less than 1000 students	87	70	80.5	120	86	71.7
1000 but less than 2000 students	62	51	82.3	73	61	83.6
2000 but less than 4000 students	39	34	87.2	39	34	87.2
4000 and over	52	48	92.3	34	33	97.1

cause of the x-ray evidence of pathology was histoplasma capsulatum.[4]

Because of the accuracy and specificity of the tuberculin test, the presence or absence of calcium deposits in the lung fields should never be a cause for confusion in tuberculosis case-finding. One who reacts to tuberculin should have regular examinations, including chest x-ray, for evidence of active tuberculosis. Conversely, except in a few rare and well-recognized instances, the non-reactor does not have tuberculosis.

Program Participation by Non-Students

The campus community presents an environment conducive to the spread of tuberculosis. Unsuspected cases living in dormitories, fraternities, or sororities are known to have infected their roommates and others. This possibility may be largely avoided if an acceptable tuberculosis program is in operation. But, students come in daily contact with a number of other members of this community, any of whom may have tuberculosis. This includes practically every one on the college staff; the administration, the faculty, and all other employees. Most health services recognize the fallacy of protecting students from each other but not from other members of this community, and some have taken steps to correct the fault (Table 9). The number is too few, by far.

Students should have the added protection that would result if all college employees were examined for tuberculosis on the same basis as students. It seems that this policy is more frequently followed at institutions using the x-ray alone as the screening method, particularly, when an outside agency conducts the program with a photo-fluorographic unit. However, it is no more necessary to x-ray the chests of all relatively older employees for the detection of signs of tuberculosis, than it is to x-ray the chests of all students. Tuberculin testing will demonstrate that many of these older people are not infected with tuberculosis, popular opinion to the contrary notwithstanding. But, regardless of how it is accomplished, there should be some plan for the inclusion of employees in the tuberculosis-control program for all colleges.

TABLE 9

Non-Student Program Participation (Faculty and Administrative Staff, Food Handlers and Other Employees) as Reported by 311 Colleges Answering Questionnaires for the School Year Ending June 30, 1947

Techniques Reported	Faculty and Administrative Staff	College Food Handlers	Other Employees
Total	311	311	311
No answer	159	111	141
*Answered, no program reported	13	38	55
X-ray, detail not reported	50	60	46
X-ray on voluntary basis	62	6	33
Annually x-rayed	6	40	10
X-rayed every 2 years	3	1	2
X-rayed every 3 years	2	—	—
New employees x-rayed	2	—	—
Test and/or x-ray	4	39	14
†X-ray special cases	2	—	2
Test only used	3	3	1
When need indicated	—	1	1
X-ray by public health service	—	4	—

*Included are colleges which do not serve meals.
†Type of case not specified.

B.C.G.

The American Student Health Association desires to contribute its share toward the solution of the tuberculosis problem. Others have said,[5] and we believe, that tuberculosis is preventable, that tools are now available which, if widely used, could lead to the eradication of the disease. How soon we reach this goal will depend, in no small measure, upon the success of our program of education regarding tuberculosis. Student health services are in the best possible position to inform vast numbers of young people about tuberculosis, and we must be prepared to meet this challenge.

To us, the knowledge that tuberculosis is caused by a germ, and that it is communicable, may seem elementary. However, we may be asked why tuberculosis, like other germ-caused communicable diseases, can not be prevented by vaccination. Recent publicity has suggested that such a possibility exists. But the results of vaccination, whether with B.C.G. or the vole bacillus, have not met with universal acceptance. Controlled experiments, using B.C.G., are now under way in the United States. The nature of tuberculosis is such that the results of these experiments must be awaited for years, even a generation. Meanwhile, it is imperative that we maintain our present tried and proved methods. Through programs such as the ones described in this report, cases may be found early, isolated to prevent spread of infection, and rehabilitated upon successful completion of treatment. A standard has thus been set for tuberculosis control, and all may see the results.

CONCLUSIONS

For many years the National Tuberculosis Association has exhibited great interest in the activities of the Tuberculosis Committee. Representatives of the N.T.A. have personally interviewed the administrative and health service officials of hundreds of American colleges and universities for the purpose of promoting interest in tuberculosis programs for students. Our organization has grown as a result of these efforts.

Because of the press of other committments the N.T.A. no longer finds it possible to be as active in our cause as in the past. However, they have kindly offered to perform all the stenographic and clerical duties incident to the mailing of our annual questionnaire, and to meet the expense of mailing. Summarization and tabulation of data from the returned questionnaires is now, for the first time in recent years, the responsibility of the Tuberculosis Committee. Fortunately, we were able to obtain help from Professor J. Belden Dennison, Director, Bureau of Business Research, Miami University, who tabulated the detailed mass of information. Without this valuable assistance completion of the report would have been a near impossibility.

Respectfully submitted,
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AMERICAN STUDENT HEALTH ASSOCIATION NEWS

Dr. B. L. Rhodes, University Physician at the University of Florida, has been recalled to active duty with the Navy and will be stationed at Treasure Island in San Francisco. Dr. Howard W. Reed, formerly of Akron, Ohio, has been appointed Director, Student Health Service, to replace Dr. Rhodes.

Robert M. Bolton, M.D., recently appointed Director of the Student Health Service at the University of New Hampshire, died suddenly in September. At last accounts a successor has not been found for Dr. Bolton.

The College of William and Mary, Williamsburg, Virginia, is looking for a full-time physician. They have an eighty bed infirmary and four nurses on the staff. The work is the care of both students and employees. Information may be obtained from President John E. Pomfret.

The JOURNAL LANCET

Official Journal of the

American Student Health Association
Great Northern Railway Surgeons' Association
Minneapolis Academy of Medicine
North Dakota State Medical Association
Northwestern Pediatric Society
Sioux Valley Medical Association
South Dakota Public Health Association
North Dakota Soc. of Obstetrics and Gynecology

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Editorial

TRADITION OR PROGRESS

Modern public health administration was conceived in the mind of Doctor Lemuel Shattuck one hundred years ago. It was detailed in the report of the Sanitary Commission of Massachusetts, the most remarkable single document in the annals of public health. This report led to the establishment of the Massachusetts State Board of Health in 1869 and Boards of Health in California, Minnesota and West Virginia in the three years that followed. It also established a pattern for the administration of local Boards of Health "appointed in every city and town, who shall be charged with the particular execution of the laws of the State and the municipal ordinances and regulations relating to public health within their respective jurisdictions." That is why Minnesota, North and South Dakota, Iowa and Wisconsin, as well as other states nearby, have their public health locally administered within each township, village and city. We have been unwilling in Minnesota to go contrary to the dictates of a century of tradition even though many of our neighboring states have learned that larger units of administration provide a better public health program.

A bill for enabling legislation to permit the establishment of county, city-county and multiple-county health departments will appear before the 1949 legislature with the hope that it will see fit to authorize an administrative pattern that will be as applicable to 20th century Minnesota as the recommendations of the far-seeing Lemuel Shattuck were to 19th century Massachusetts.

During the 75 years that Minnesota has had a State Board of Health and the 100 years that it has had Municipal Boards of Health, the control of communicable disease has been paramount. A more positive approach directed toward healthful living, as well as disease prevention, characterizes modern public health. Heart disease, cancer, intra-cranial lesions of vascular origin, and external violence are now the leading causes of death, replacing tuberculosis, typhoid fever, dysentery and other communicable diseases. Though we are concerned with the occasional disease out-break, we are more concerned with the efforts that lead to an increased expectancy. The definition of health used by the World Health Organization — that "health is the complete physical, mental and social well-being of a people, and not the mere absence of disease"— is the objective toward which we must work. This concept of public health requires physicians, dentists, nurses, engineers, educators and other professional personnel trained in the skills of public health administration. Townships and villages are no longer large enough units of government to employ the kinds of personnel needed to do the job. The rural areas, which have been lagging behind the urban areas in their health protection, cannot improve until they enjoy the same advantages of trained personnel enjoyed by the center of population.

The future public health administration in Minnesota rests with the 1949 legislature. Will it authorize the establishment of competent local health departments, or will it adhere to the traditions established by Lemuel Shattuck?

D. A. Dukelow, M.D.
Executive Secretary
Minn. Public Health Conference

. . . NEWS ITEMS . . .

NORTH DAKOTA

Dr. A. M. Call was honored by residents of Rugby, North Dakota, after 45 years of active practice in Rugby.

Dr. Budd C. Corbus, Jr., of Fargo, was guest speaker at the meeting of the Devils Lake District Medical Society September 15. Eighteen medical men attended the session, which was presided over by Dr. Ted Keller of Rugby.

At a recent meeting of the board of directors of the Turtle Lake hospital committee it was decided to dedicate the lobby to Dr. G. E. Heinzeroth.

The board felt this would be some way to show the local doctor the esteem he holds with the people that he has been serving for the past 41 years.

The board will set up a separate fund for this purpose and all donations for this will be kept separate for the purpose of building this part of the building.

A letter will be sent to all persons that are known by Dr. Heinzeroth and they will be asked to donate to this cause.

A list of all donors will be set up in a permanent file in the lobby when completed.

Members of the executive board of the Women's Auxiliary to the North Dakota State Medical Association met in Fargo for the annual fall meeting, September 30. Dr. W. E. G. Lancaster, Fargo, spoke on Medical Economics.

Dr. H. B. Huntley of Kindred attended the Association of American Physicians and Surgeons at Akron, September 30, and on October 1st and 2nd attended the annual meeting of the A. A. P. S. as the delegate from North Dakota.

With the recent completion of its new 27-bed hospital, and the arrival of a second doctor, Hazen now boasts medical facilities equaled by few small towns in the state. And more facilities are on the way.

Dr. Walter Enders, who has recently completed his training at Ancker hospital in St. Paul, Minnesota and joined Dr. E. G. Vinje, are now awaiting the construction of their new clinic building, which will increase their daily capacity for treating patients.

Added to the staff of Fargo clinic in the department of surgery is Dr. G. Howard Hall, who was chief of surgical service at Fargo Veterans hospital from July, 1947, to Sept. 1, 1948.

A native of Minneapolis, Dr. Hall was educated at Iowa State university, Northwestern and University of Minnesota, receiving his medical degree at the latter in 1938. Following internship at Minneapolis General hospital he had 26 months fellowship training at University of Minnesota under Dr. O. H. Wangensteen.

After a year of further postgraduate training at Minneapolis Veterans hospital as a staff member of the University of Minnesota he came to Fargo.

Dr. Hall has been a diplomate of the American Board of Surgeons since October, 1947.

Dr. Phillip Blumenthal of Anoka, Minnesota, plans to take up the practice of medicine in Mandan. Dr. Blumenthal is a graduate of the University of Minnesota medical school.

Dr. John H. Graham, formerly with the Fargo clinic, has opened offices in Northwood.

A health center under construction at Gackle is nearing completion. The center, which is being financed by Gackle businessmen, will accommodate a doctor and a dentist, maternity ward, delivery room, laboratory and reception room.

The Lake Region Clinic have opened their offices in a new clinic building, it was announced by K. O. Holter, clinic business manager. Doctors who are affiliated with the clinic are Drs. John C., Donald W. and Robert M. Fawcett and Dr. John D. Graham.

SOUTH DAKOTA

Lyle Hare, 62, of Spearfish—was named today as South Dakota's "general practitioner of the year." The state medical association, which chose him for the honor, described him as "weathered by years of hard work, but still as rugged as the Black Hills of South Dakota."

He will represent South Dakota in the national contest for "general practitioner of the year."

Dr. Hare has set a gruelling pace in his 35 years as a country doctor. He has delivered more than 3,000 babies—more than the population of his home town of Spearfish.

Dr. Hare has gone by horseback, sleigh, foot, car and airplane to help the sick in rural areas.

The doctor was graduated from Black Hills Teachers college in 1907 and in 1909 became the first graduate of the University of South Dakota's two-year medical school.

Hare finished his medical studies at the University of Illinois, interned at University hospital at Chicago and headed straight back to the Black Hills to be a country doctor.

During World War I, Dr. Hare left his practice, joined the army medical corps and performed surgery on wounded soldiers in France. In World War II he was surgeon for 300 cadets at Black Hills Teachers in addition to his regular practice.

Recently the Medical Society of South Dakota honored Dr. Frank H. Creamer of Dupree as the Doctor of the year.

Dr. Creamer came to Dupree at its very beginning in the summer of 1910 and has practiced his profession here ever since except when he served as an Army doctor during World War I.

Two pioneer doctors were honored at the September meeting of the Bryant Chamber of Commerce. They were Dr. H. C. Larson, dentist, who came to Bryant in 1902, and Dr. G. L. Hickman, physician, who has been in Bryant since July 20, 1912.

Dr. Thomas W. Reul has become affiliated with a clinic in Watertown. Dr. Reul has been a member of the Bartron hospital and clinic staff since July, 1947. He will specialize in x-ray, internal medicine and diagnosi.s.

Dr. Ellison F. Kalda of Wagner is a new staff member of the Spiry-Harris medical clinic at Mobridge. He will be associated with Dr. A. W. Spiry and Dr. L. D. Harris in the general practice of medicine and surgery. A graduate of Temple university, Dr. Kalda took his internship at Staten Island hospital, New York, and had a general practice at Wagner before joining the local clinic.

After taking a postgraduate course in obstetrics and gynecology in Chicago, Dr. Robert H. Quinn has returned to Sioux Falls to enter the general practice of medicine and surgery. He has opened an office at the Sioux Falls clinic.

Dr. Rodney M. Smith, physician and surgeon, of Longmont, Colo., arrived in Winner in September to join Dr. Studenberg in the practice of medicine.

Dr. David S. Berkman of Rochester, Minn., has joined the staff of the Kegaries and Dawley Clinic in Rapid City, following completion of a fellowship in internal medicine at the Mayo Clinic.

MINNESOTA

The story of research in the field of cancer was told by outstanding medical and scientific authorities to the annual membership meeting of the Minnesota Division of the American Cancer Society October 1.

A series of five-minute word pictures of the work in their several fields were drawn by Dr. A. E. Cardle, president of the Minnesota State Medical Association; Dr. Owen H. Wangensteen, head of the university's department of surgery, under which the Cancer Detection center operates; Dr. Arthur H. Wells, Duluth, president of the Minnesota Division of the American Cancer Society.

Dr. A. C. Broders, Sr., head of the department of surgical pathology in the Mayo Clinic and professor of pathology in the Mayo Foundation, was honored with several scientific and medical memberships in South America on a recent trip.

Dr. Philip S. Hench was one of ten physicians and scientists named recently, in a meeting held in Chicago, to a committee which will guide medical policies of the newly formed arthritis and rheumatism foundation.

Several hundred Upper Midwest obstetricians attended the Minnesota Obstetrical and Gynecological Society convention at the Radisson hotel on October 7. The Minnesota group were host to physicians from Wisconsin, Iowa, and North Dakota. Mr. Everett C. Hartley, St. Paul, is president of the Minnesota society.

Dr. Thomas J. Kinsella was elected president of the Mayo Foundation Alumni Association at the annual meeting in Rochester. Dr. Ronald C. Balfour, Rochester, was named honorary president. Other officers are Dr. John M. Fallon, Worchester, Mass., first vice president; Dr. John L. Kleinheksel, Wichita, Kansas, second vice president; Dr. Jas. F. Weir, Rochester, secretary, and Dr. Edw. S. Judd, treasurer.

Six public health authorities from the University of Minnesota will be among the 300 who will present papers before the seventy-sixth annual meeting of the American Public Health Association in Boston November 8 to 12.

Among the speakers are Dr. Gaylord W. Anderson, director of the school of public health, and Dr. Maurice B. Visscher, director of the department of physiology.

After 40 years of practice in Albert Lea and area, Dr. Andrew Gullixson has retired. In semi-retirement in recent years, he compiled a book about the medical profession in Freeborn county which has now been published. It is called "Notes on Medicine in Freeborn County from 1852 to 1900."

Dr. Burton P. Grimes, assistant superintendent of the St. Peter State Hospital, was appointed superintendent of that institution.

The announcement was made by Carl H. Swanson, state director of public institutions. Grimes succeeds Dr. George Freeman who has resigned to become superintendent of the Montana state hospital at Warm Springs.

Dr. S. S. Houkom, orthopedic specialist from the Duluth Clinic, was the speaker at the recent Range Medical society meeting. Presiding was Dr. Frank Kochevar, Eveleth.

Dr. E. L. Tuohy and Dr. Henry G. Moehring, both of Duluth, presented pathology cases for general discussion at the annual joint fall meeting of the Range and St. Louis County Medical Societies.

Dr. Lewis I. Younger, Winona, was elected president of the Southern Minnesota Medical Association at the annual meeting of the organization at the Winona Country Club. He succeeds Dr. C. L. Sherman, Luverne, who has served the association as president during the past year. Dr. W. E. Wilson, Northfield, was elected first vice president and Dr. Raymond F. Hedin, Red Wing, was made second vice president, Dr. W. A. Merrit, Rochester, was re-elected secretary and treasurer. The association selected Red Wing as the city for the next annual meeting.

Research prizes were awarded to two fellows of the Mayo Foundation by the Alumni association of the foundation holding its 25th annual meeting. Dr. Lewis B. Woolner was awarded $300 for his research on cancer cells in bronchial secretion and Dr. Chas. A. Owen received $150 for research in the conversion of the drug prothrombin into thrombin.

Dr. R. S. Ylvisaker was elected president of the attending medical staff at Northwestern hospital at the annual staff meeting. Dr. J. C. Miller is the retiring president.

Dr. Edwin G. Benjamin was named vice president and Dr. Albert T. Hays secretary-treasurer.

New members of the executive committee are Drs. Lawrence Larson, Chauncey A. McKinlay, Samuel B. Solhaug, Kenneth J. St. Cyr, Cyrus O. Hansen and Stanley Lofseness.

Several Minneapolis doctors have recently entered practice. Dr. Hanns Schwyzer and Dr. Martin Albert Nordland, who has completed a fellowship in surgery at the Mayo foundation, Rochester, Minn., will be associated with his father, Dr. Martin Nordland, in the practice of surgery.

Dr. Robert F. Deranleau will be associated with Doctors Paul N. Larson and William B. Stromme in the practice of obstetrics and gynecology.

Dr. Norman Schneidman, who has completed graduate work at University of Minnesota and the Veterans hospital here, is practicing internal medicine.

DEATHS

Dr. Jacob M. Hjortland, 59, Laurel, Montana, a one-time Fargo, N. D., physician, died September 12.

Dr. David L. Tilderquist, 76, a Duluth physician for 44 years, died September 26.

Dr. Andrew B. Rivers, 54, of Rochester, Minnesota, an authority on gastrointestinal disease, died October 3.

Dr. Alfred Hoff, 65, an associate professor of medicine at the university and practicing physician of St. Paul, died October 9.

Dr. M. E. Withrow, 78, International Falls, Minnesota, a practicing physician for 45 years, died Oct. 14.

. . . BOOK REVIEWS . . .

Modern Clinical Psychiatry, by Arthur P. Noyes, M.D., Superintendent, Norristown State Hospital, Norristown, Pa. Philadelphia: W. B. Saunders, 1948, 3rd Ed., $6.00.

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Dr. Noyes has brought his textbook of psychiatry up to date with the first new edition in eight years. The book follows the same general outline as before, with the addition of three chapters at the conclusion of the book: Psychotherapy; Shock Therapy, and Child Psychiatry. Covering the entire field of psychiatry in a book of 500 pages necessitates succint and, therefore, often inadequate discussion. On the other hand, the book serves as a comprehensive orientation for the medical student, beginner in psychiatry, general practitioner, and medical or surgical consultant. The bibliography is interposed in the chapters to which the references belong. Journals up to 1947 are cited. The book is well printed and attractively bound.

The definitions of the important psychiatric concepts, as well as mental mechanisms and motives should be read and understood by all physicians. The psychosomatic expressions of the organism, whose more general acceptance is coming into vogue, is lucidly but briefly written. The emotional components of physical illness is not overlooked, but the essential unity of psyche and soma prevails.

The book begins with a general chapter on the mind, which the author defines as follows: "Mind, then, is the mentally integrated function of the organism that has been evolved by the necessity for its adaptation to the conditions which it must encounter." It would be cavilling to cite this sentence lifted from the text and left cold, if one did not state that the general tenor of the book is scholarly and often critical, based upon the author's long experience.

The various psychiatric disorders are discussed in about 300 pages, following the 1934 classification of the American Psychiatric Association. Insulin shock therapy is described but its results are presented in only 40 words. Only the bare essentials of electric shock appear in the special chapter on Shock.

The book is recommended to all interested in learning more about psychiatry from a practical clinical standpoint.

H. W.

Coronary Heart Disease, by A. Carlton Ernstene, M.D., Chief of the Section on Cardiovascular Disease, Cleveland Clinic, Cleveland, Ohio. Springfield, Illinois: Charles C. Thomas, Publisher, 1948, 102 pages; $2.50.

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In this monograph the author has reviewed important knowledge to date on coronary heart disease from the standpoint of the clinician. Included are chapters on angina pectoris, acute myocardial infarction, acute coronary failure, paroxysmal cardiac dyspnea (cardiac asthma), heart block and disturbances of cardiac rhythm, congestive heart failure and the risk of anesthesia and surgical operation in patient with coronary disease together with references to relevant articles.

This monograph correlates material in a manner that commands the respect of the internist and cardiologist. It would also be worthwhile reading for any physician or surgeon of inquiring mind. C. A. M.

Brief Psychotherapy, by Bertrand S. Frohman, M.D. With the collaboration of Evelyn P. Frohman. Foreword by Walter C. Alvarez, M.D. Philadelphia: Lea & Febiger, 265 pages; $4.00.

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This book has fulfilled the desire of the practical-minded physician who often recognizes problems requiring psychotherapy and wants guidance in curing his patients without subjecting them to the long course of classic psychoanalysis.

Dr. Frohman makes available a simple, lucid, and rapid technique which directs the physician's own inherent common sense in treating his patients and giving them insight into their emotional conflicts.

Those in general practice and in the specialties will find this book extremely valuable in their daily practice. It is concise, well-organized and written in an interesting style with adequately abstracted case histories.

The patient can be permitted to read pertinent sections of this book since there are a minimum of technical terms and these are explained in the glossary.

After reading this book it will be needless to explain that Dr. Frohman was a successful general practitioner and is now a successful psychiatrist and an excellent teacher.

J. W.

On Understanding Science, an Historical Approach, by James B. Conant. New Haven: Yale University Press, 1947, 109 pages, $2.00.

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This essay was presented as one of the Dwight H. Terry Foundation Lectures on Religion in the Light of Science and Philosophy. "The object of the Foundation is not the promotion of scientific investigation and discovery, but rather the assimilation and interpretation of that which has been or shall be hereafter discovered, and its application to human welfare."

The President of Harvard has complied with the requirements of the Terry Lectureship to instruct the public and at the same time formulate a method for teaching science. His experience during the war years with the development of atomic energy emphasized the necessity for education of the laity in scientific matters and methods.

To serve this purpose he has chosen the historical approach, that is, by describing the ways in which particular scientists thought and worked to discover a few fundamental principles, and by discussing the influence of some basic concepts upon human living. The forthright statements in the first sentence of Chapter One comprise the theme of the discourse. An understanding of science for "lawyers, writers, teachers, politicians, public servants and business men" should be inculcated by collegiate instruction. From recent relations his concern is probably with the last three groups; the primary consideration is, of course, that these are properly exposed to education on the college level. What President Conant is suggesting is that scientific knowledge is integrated with secular culture to form a political, economic or social conduct, national or international.

And/or an individual understanding of general science is not formidable. An intelligent and thorough acquaintance with the group of facts pertaining to a single sphere of activity is adequate for apprehension of most other technical or cultural areas. The particular examples of scientific conduct narrated by Conant elucidate this thesis. J. B. C.

Diabetes Mellitus in General Practice, by Arthur R. Colwell, M.D. Chicago: The Year Book Publishers, 1947. 350 pp., illustrated. $5.25.

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The newer methods of diagnosis and differential diagnosis of diabetes mellitus are handled thoroughly in this new manual, together with treatment by diet and with insulin, and therapies for both acute and chronic complications. Full coverage is given urinalysis, blood sugar levels, glucose tolerance tests and the recognition of mild asymptomatic cases and differentiation of bizarre types. In addition, the author, who is Associate Professor of Medicine and Director of Medical Specialty Training at Northwestern University Medical School, treats with the various transient and harmless meliturias frequently confused with diabetes.

A chapter on Treatment by Diet gives the criteria for such therapy and describes methods of determining and prescribing quantitative diets, desugarization, maintenance and reducing diets, etc. Similarly thorough is a chapter on Treatment with Insulin, which establishes the criteria of need and shows the role of desugarizing, carbohydrate, average diabetic diets., etc.

Separate chapters on treatment of acute and chronic complications provide useful information not always available in standard texts.

Diabetes Mellitus in General Practice is simply and soundly presented and attempts to explain fully every clinical feature of diabetes from a practical point of view. J. N.

BOOK REVIEWS—(Continued)

Surgical Disorders of the Chest: Diagnosis and Treatment, by J. K. DONALDSON, B.S., M.D., F.A.C.S. Philadelphia: Lea & Febiger, 1947, 471 pp., $8.50.

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Although thoracic surgery has made tremendous strides in the past decade, it is still true that most chest cases requiring surgery are treated by general rather than thoracic surgeons. This is a text written by a thoracic surgeon primarily for dissemination of information on the subject to men interested in all surgical problems. Dr. Donaldson has covered in this book the important diagnostic techniques in chest conditions and the principles of surgical treatment of this region. The bases of the author's experience in this field are his work in the department of surgery at the University of Arkansas and his army service in World War II as chief of the surgical service in various hospitals.

The work may be regarded as a primer in surgical diagnosis and treatment of chest diseases. Since so much of chest disease lies in the medical domain this reviewer feels that more emphasis might properly have been given to the diagnostic criteria leading to the selection of the case eventually becoming surgical. Specifically the work suffers from lack of collaboration with those skilled in the medical aspects of chest diseases.

With the increase in the field of chest surgery every general practitioner and internist as well as the surgeon must be informed of the therapeutic possibilities in chest surgery. World War II has given impetus to this region in the field of surgery. The book is an excellent source of information to those not specializing in this field. R. B.

Clinical Laboratory Methods and Diagnosis: 4th Edition, in Three Volumes with Two Indices. Volumes I and II by R. B. H. GRADWOHL, M.D.; Volume III by R. B. M. GRADWOHL, M.D., and PEDRO KOURI, M.D. St. Louis: The C. V. Mosby Co., 1948, 3300 pp., 1100 illustrations. $40.00.

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Dr. Gradwohl's new edition of his well-known *Clinical Laboratory Methods and Diagnosis,* now in its fourth edition, has become an encyclopedia in three volumes with some 3000 pages. He has covered the field from the common procedures of the urine and blood laboratories through the gross and tissue studies of the post-mortem room. The work is truly monumental in scope, attempting as it does to cover the field of laboratory diagnosis. In the field of parasitology and tropical medicine covered in Volume III, Dr. Pedro Kouri of Havana, Cuba, collaborated.

The work seems to have been designed as reference material for a large hospital laboratory. To this reviewer it is also an excellent text for the shelf of even the smallest private physician's laboratory. It amounts to the 1948 encyclopedia on laboratory procedure. Directions are so clearly given that for the most part a technician could do most of the tests with no other instructions than that provided by the text. R.B.

Congenital Malformations, by DOUGLAS P. MURPHY, M.D., F.A.C.S. Philadelphia: J. B. Lippincott, 1947. 127 pages. $5.00.

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When a congenitally malformed child is born, its parents often embarrass their family physician with questions concerning etiology, prognosis and the outlook for further pregnancies. This monograph attempts to assist the medical profession in understanding these malformations and interpreting them to the public. The work is largely statistical, aimed chiefly at determining frequency tables of somatic defects of congenital origin. R. B.

Diseases of the Nose, Throat, and Ear, by WILLIAM LINCOLN BALLENGER, M.D., F.A.C.S., and HOWARD CHARLES BALLENGER, M.D., F.A.C.S., assisted by JOHN JACOB BALLENGER, B.S., M.D. Philadelphia: Lea & Febiger, 1947. 903 pages. $12.50.

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Ballenger's text on the ear, nose and throat, now in its ninth edition, is a well accepted standard work on the subject. The chapter on headaches and neuralgia is new. It is a work of great detail intended as a text for specialists in this field but it must also be recommended for general practitioners doing operative otolaryngology. R. B.

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PREPARATION OF MANUSCRIPTS

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Manuscripts are to be typed on one side of the paper with double spacing. Illustrations must be in the form of glossy prints or drawings in black ink. Please do not attach legends to the pictures. A reasonable number (two or three) illustrations are published free of cost; special arrangements must be made for excess or highly finished illustrations or tables.

Bibliographic references should be at the end of the manuscript and not in footnotes. Each reference should include the following information in the order indicated: Name of author with initials; title of article; name of periodical; volume, page and year. Reprints are prepared on order.

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The JOURNAL LANCET

Minneapolis, Minnesota
December, 1948

Vol. LXVIII, No. 12
New Series

Advances in the Diagnosis and Treatment of Thyroid Disease*

Mavis P. Kelsey, M.D.
Rochester, Minnesota

During the past ten years rapid advances have been made in the study and treatment of thyroid disease. Until this recent time it appeared that in this field we physicians had reached the peak of our capabilities, little having been added to our knowledge since 1923 when Plummer established the value of iodine in the treatment of exophthalmic goiter. Now there is fervent activity, and a number of tools to study the thyroid gland are being used. These include radioiodine, goitrogenic drugs, blood iodine determinations and thyrotropic hormone. The latter two tools are mainly useful to research men. Radioiodine and goitrogenic drugs, however, have been interesting to physicians in general and the greater part of this paper is devoted to these agents.

GOITROGENIC OR ANTITHYROID DRUGS

Discovery. Knowledge of the therapeutic value of the goitrogens grew out of an observation in 1927 that goiters developed in rabbits fed a cabbage diet.[1] Scattered reports soon indicated that several agents produce goiter and myxedema. In 1943 Astwood[2] and co-workers, after testing the goitrogenic potency of many of these related compounds, successfully applied thiourea and thiouracil to the treatment of human thyrotoxicosis. Propylthiouracil was first reported by Astwood and Vanderlaan in 1945.[3] Its action seems to be the same as that of thiouracil, but it has the distinct advantage of producing fewer toxic reactions. Because of its greater safety, it has almost completely supplanted thiouracil and it is considered the best goitrogenic drug available today. At present, only thiouracil and propylthiouracil are on the market in the United States, while methylthiouracil and aminothiazole, two of many new goitrogens undergoing therapeutic testing, have been reported in the literature several times.

Although their action is not understood, the goitrogens relieve hyperthyroidism by depressing the formation of thyroid hormone. They are effective against all types of hyperthyroidism but are most useful in selected cases of exophthalmic goiter.

Dosages and toxic reactions. The optimal initial dose of thiouracil for adults is 0.4 to 0.6 gm. daily, administered in three or four parts.[4,5] Daily doses up to 1.2 gm. have been given.[6] The maintenance dose varies from 0.05 to 0.2 gm. daily. Originally, propylthiouracil was given in too small doses. It now appears that the initial daily dose is around 0.3 gm.[7] divided into three or four parts. A dose of 0.15 gm. has been effective, while a daily dose as large as 0.8 gm. has been given safely for several weeks. The usual maintenance dose varies from 0.05 to 0.15 gm. daily.

The initial dosage of goitrogen is maintained until clinical response has occurred. This may begin within a week or as quickly as the like response to iodine. In some cases there may be no response for one to three months, or until the dosage of the drug is increased. Occasionally, thyrotoxicosis is partially or completely resistant to one goitrogen while another may effectively control it. With improvement there is concurrent diminution of basal metabolic rate, increase of serum cholesterol, and subjective relief. If the goitrogen is effective, amelioration of thyrotoxicosis is complete within several weeks to several months. The dosage should be reduced as the basal metabolic rate reaches normal; otherwise myxedema is likely to appear. If medical management of the patient is desired, maintenance doses are instituted and adjusted according to the patient's response as measured by repeated determinations of basal metabolic rate or serum cholesterol. Once a maintenance dose is established it is usually stationary, but some patients may require a subsequent increase in dosage.

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*Read at the meeting of the North Dakota State Medical Society, Jamestown, North Dakota, May 25, 1948.

Van Winkle and co-workers[5] determined the incidence of toxicity to thiouracil in almost 6,000 cases in which patients were treated by 328 investigators. Toxic reactions occurred in 13 per cent of cases, the principal reactions being granulocytopenia, leukopenia, drug fever and dermatitis. Thiouracil occasionally produces nausea, diarrhea, thyroiditis, parotitis, psychoses, joint pains, purpura, jaundice, secondary anemia, oral sepsis, edema of the legs, hematuria and enlargement of lymph nodes.[5,8,9]

Granulocytopenia, the most serious complication, occurred in 2.5 per cent of patients reported by Van Winkle. The leukocyte count is usually less than 4,000 per cubic millimeter of blood with marked diminution or absence of granulocytes. Onset is often sudden, with fever, sore throat and prostration. Seventy per cent of these reactions occur within the first eight weeks of treatment, but one reaction occurred eighteen months after onset of treatment. The dosage, duration of treatment and associated premonitory symptoms do not provide any safe rules whereby this complication can be avoided. Neither does prophylactic administration of folic acid[10] nor liver extract.[11] Blood counts must be done two or three times a week and differential counts should be made when the total leukocyte count falls to near 4,000 per cubic millimeter of blood. When granulocytopenia develops, the medication should be stopped immediately. Even so, complete granulocytopenia may occur after administration of the drug has been stopped. If recovery occurs, the blood count will begin to rise within four days after administration of the drug has been stopped. Penicillin in doses up to 1,000,000 units daily is the treatment of choice for this reaction. The mortality rate is about 0.5 per cent of the total patients receiving thiouracil. This reaction is the only one reported to have produced fatalities.

Leukopenia or a leukocyte count of less than 4,000 per cubic millimeter of blood, a normal differential count and no symptoms, has an incidence of 4.4 per cent. Most cases occur before the eighth week of treatment and many pass into granulocytopenia if treatment is not stopped. Drug fever, with an incidence of 2.7 per cent of cases, also occurs early in treatment. Blood counts should be made immediately after onset of fever to make sure it is not a manifestation of agranulocytosis.

The reactions from propylthiouracil have been essentially of the same type as those from thiouracil but the incidence has been only about 3 per cent. Pruritus is probably more common with propylthiouracil than with thiouracil, but it is usually transitory and usually does not preclude treatment. Agranulocytosis,[12] leukopenia,[13] drug fever,[13] urticaria[14] and jaundice[15] are reactions which have been reported.

The safest precaution in case of a reaction is to discontinue administration of the goitrogen. This is mandatory in the serious reactions, but a continuance of a smaller dose may relieve mild reactions and still maintain a normal metabolic rate. Changing to another goitrogenic drug may also alleviate the reaction. As with other drugs, repeated starting and stopping of the medication may produce sensitization and should be avoided.

Methylthiouracil, which has been used widely in England, is said to require about the same dosage as propylthiouracil and produce the same incidence of reactions. Not enough observations have been made yet to evaluate it. It is said to relieve symptoms more rapidly than does thiouracil or propylthiouracil.[16] Agranulocytosis,[17] dermatitis[16] and fever[17] have been reported as toxic reactions to this drug.

Aminothiazole is a goitrogenic drug which has been used in France[18] but the high incidence of toxic reactions which it produces makes it an unsatisfactory drug.[19]

Uses of goitrogens. The goitrogens are given for two purposes: (1) continuous medical management in selected cases of hyperthyroidism unsuitable for surgical measures; (2) preoperative preparation for thyroidectomy in cases of severe or complicated hyperthyroidism. Originally it was hoped that these drugs would provide a satisfactory medical cure in most cases of exophthalmic goiter. The high incidence of toxic reactions, the tendency for hyperthyroidism to recur on discontinuance of the medication and the notable success of surgical treatment in the average case soon led clinicians to limit the use of goitrogens sharply. The introduction of radioiodine has restricted even further the use of goitrogens for continuous medical management. At the Mayo Clinic we find use for goitrogens in only an occasional patient.

Continuous medical management. Prolonged remissions have been produced in about 40 to 60 per cent of patients who had exophthalmic goiter treated by thiouracil or propylthiouracil.[20,21] The longer the basal metabolic rate has been at zero or lower, the better are the chances for permanent remission. Administration of thiouracil for three months has produced permanent remission in a few cases but there is much individual variation. Usually, if a remission is going to occur, eight to twelve months' therapy is enough to produce it. In most of the cases in which there is a relapse, it develops within a few months after discontinuance of medication.[21] Williams and co-workers[21] found that 70 per cent of relapses occurred within two months after medication had been stopped and 88 per cent within five months but one relapse did not occur until twenty months after treatment. Usually if a relapse does not occur within a year, there is little likelihood of it. Females with small goiters and mild hyperthyroidism have the lowest incidence of relapse.[21]

Some remissions have been observed for three or more years but it must be remembered in evaluating these results that spontaneous remissions occur in thyrotoxicosis and also that thyrotoxicosis may recur several years after surgical cure. Recurrences may be treated by a second or even a third course of goitrogenic drugs. Williams [22] pointed out that some patients cannot be controlled by goitrogens until iodine therapy is added to the program. Actually in some of these cases the patients are probably responding to the iodine alone. Dobyns and Haines [23] observed an increase of exophthalmos accompanying improvement of thyrotoxicosis in some cases and treated it with desiccated thyroid and iodine. Auricular fibrillation and angina pectoris are often controlled along with hyperthyroidism, and accompanying diabetes mellitus is likewise improved.[24] The use of thiouracil in treating angina pectoris in patients with normally functioning thyroids has not been successful.[25]

Pregnant women should be given goitrogenic drugs with caution, if at all, until more information has accumulated.[26] Williams [21] did not see evidence of goiter or disturbance of thyroid function in the offspring of his pregnant patients at birth or for a year thereafter. Another writer [27] saw exophthalmos, agitation and hypocholesteremia develop in a two month old child delivered of a thyrotoxic mother treated with methylthiouracil. A woman, six months pregnant, died suddenly while under treatment for hyperthyroidism with thiouracil. The fetus had a hyperplastic enlarged thyroid.[28] A mother taking goitrogenic drugs should not nurse her baby, since the mother's milk may contain enough of the drug to cause goiter and myxedema in the baby.[29]

The morbidity and mortality rates from thyroidectomy in mild uncomplicated hyperthyroidism are still lower than that from any present-day goitrogen. The perfect goitrogen which does not cause toxic reactions and which effects a complete cure has not yet been found. For this reason propylthiouracil and other goitrogens are best used for medical management in only those cases in which surgical treatment is unsuitable. The most likely cases are those of serious heart disease, recurrent exophthalmic goiter with vocal cord palsy and the rare patient with concurrent disease such as an incurable malignant lesion which foretells a very short life expectancy, or the patient who cannot be prepared for surgical treatment because of dangerous sensitivity to iodine. Less justifiable indications for medical treatment are fear of surgical treatment and the great expense in time and money of surgical treatment. Actually long-continued medication with a goitrogenic drug and frequent observation of the patient impose a greater burden on both the patient and the physician than does surgical treatment. Patients who definitely should not be treated with prolonged administration of goitrogens if surgical treatment can be made reasonably safe include patients having nodular goiters which may be disfiguring, cause tracheal or esophageal compression or contain malignant lesions. Although not proved in humans there is some experimental evidence that goitrogens may be carcinogenic.[30] Adematous goiter with hyperthyroidism does not respond quickly to the goitrogens. Patients who are un-co-operative make very poor subjects for prolonged medical control of hyperthyroidism.

Preoperative preparation with goitrogens. Thyroidectomy after preparation with iodine is still the treatment of choice for mild or moderate uncomplicated hyperthyroidism. These cases make up the vast majority seen at the Mayo Clinic. Iodine therapy is usually a much quicker method of preoperative control than goitrogenic therapy but in the infrequent case in which iodine fails it is advisable to supplement the therapy with a goitrogenic drug. The best preparation for surgical procedures in cases of severe hyperthyroidism is by complete control of the thyrotoxicosis with a goitrogen. Six to twelve weeks are usually required to prepare the patient by this method. The patient may be restored to fairly normal health before surgical procedures, a state which makes satisfactory anesthesia and postoperative course more probable.[4] Administration of iodine can be started concurrently or when the basal metabolic rate reaches +20 per cent, or at least one or two weeks before the operation. Unless iodine is given in these cases the gland is large, friable and highly vascular, and bleeds freely, thus offering technical difficulties to the surgeon. Iodine causes involution of hyperplastic epithelium, fills the follicles with colloid and reduces vascularity of the gland. Administration of thiouracil may be discontinued for a week before operation to enhance involution and to ensure that no toxic reaction occurs.

Preoperative preparation with propylthiouracil is also an extremely valuable adjunct in cases of high surgical risk resulting from organic heart disease and old age. Use of goitrogens has reduced the surgical mortality rate from about 1 per cent to practically zero in the Cleveland Clinic where thyroidectomy was performed 734 times without a death.[31] The morbidity and injuries connected with thyroid surgery were also greatly reduced, there being very few instances of recurrent laryngeal nerve palsy and parathyroid tetany.

RADIOIODINE

Radioiodine is now being used for the diagnosis of certain thyroid dysfunctions and for the treatment of hyperthyroidism and cancer of the thyroid. This field of medicine is in its infancy and only a few medical centers have the personnel and equipment to use radioiodine properly. Several years of hard work will be required to determine the clinical usefulness of radioiodine and to establish strategically located laboratories throughout the country so that patients can be conveniently cared for. In the meantime physicians, not working on the immediate problems involved, are interested in knowing how radioiodine can be applied to their patients.

Most radioactive isotopes, including those of iodine, are prepared today in chain reacting atomic piles or by cyclotrons. Radioiodine has the identical chemical properties of stable iodine, but in addition it has the property of emitting radiations. By counting these radiations with a Geiger counter one can measure radioiodine quantitatively in an amount so small that the most delicate chemical determinations would not reveal its presence. The radiations have the same biologic effects as the radiations emitted by radium or x-ray machines and, because of selective localization of the substance in the thyroid gland, radioiodine can be administered by mouth to produce internal irradiation of thyroid tissue.

More than ten radioactive isotopes of iodine have been prepared. Today most of the radioiodine in use is I_{131} made in the atomic pile at Oak Ridge, Tennessee, by the Atomic Energy Commission, and shipped by air at a cost of $1.70 per millicurie. I_{131} emits beta particles and gamma rays to disintegrate into xenon. Its half-life is eight days; at the end of eight days half the stock on hand will have disintegrated; in eight more days half of what was left will have disintegrated; and at the end of fifty-three days nearly 99 per cent of the original stock will have disintegrated.

All radioactive material is dangerous and it must be handled with great care. Precautions similar to those used by radium therapists must be adopted by persons handling radioiodine. This calls for trained personnel and for remote control instruments which prevent harmful amounts of the isotope or its radiations from coming in contact with the technician. Urine from patients who have received radioiodine may contain dangerous quantities of the isotope and its disposal is a difficult problem, considering the number of untrained hospital personnel who may handle it, misplace it or spill it and contaminate a room with a radioactive material. Areas where radioiodine is used should be measured frequently for gamma ray activity and personnel should wear instruments to measure the amount of radioactivity to which they are exposed. A single dose or a few carefully measured doses can be tolerated by a patient with safety so far as the immediate future or subsequent few years are concerned. The possibility of carcinogenesis in later years or genetic effects in descendants is still unknown and this should be considered when patients are selected for therapy.

Iodine metabolism determined by radioiodine. The usual tracer dose of radioiodine is 100 microcuries. Often 100 micrograms of sodium iodide is added as a carrier to prevent the adsorption of the radioiodine on glassware. The dose, which is tasteless and colorless, is given in a glass of water. The patient's stomach should be empty but he can eat an hour later, at which time 90 per cent of the dose will have been absorbed by the gastro-intestinal tract. The blood concentration rises to a peak level within an hour after ingestion, then tapers off. As soon as radioiodine enters the blood stream the thyroid begins collecting it and the kidneys begin excreting it. In a normal person about 60 to 70 per cent of the dose is excreted in the urine at the end of forty-eight hours,[32] the thyroid collects about 20 to 30 per cent of the dose and about 10 per cent of the dose is distributed elsewhere in the body. From this it may be seen that a measurement of the radioiodine excreted in the urine gives a fairly accurate indication of the amount collected by the thyroid. Since urinary measurement is very satisfactory from a technical standpoint it is the method commonly used.[33]

Hyperthyroidism. In cases of both diffuse toxic goiter and nodular goiter with hyperthyroidism the thyroid collects an abnormally high amount of radioiodine at a rapid rate.[32] From 40 to 90 per cent of the tracer dose goes into the thyroid and the urine may contain only 5 to 50 per cent of the dose. As might be expected there is a wide range of thyroidal uptake, since cases of hyperthyroidism vary in severity and the goiters vary in their avidity for iodine. Although not enough experience has accumulated to avoid errors in interpretation, this tracer test has become a useful diagnostic tool at the Mayo Clinic. It is particularly helpful in patients with elevated basal metabolic rates in whom anxiety tension is suspected as the cause of hypermetabolism, in whom hypertension or other factors may alter the metabolic rate, or in whom there is little or no palpable goiter. It is also useful in patients having normal metabolic rates but having other clinical evidence suggesting hyperthyroidism. It must be kept in mind that renal disease and congestive heart failure may cause a low renal excretion of radioiodine. Administration of thiouracil, iodine or thyroid extract, on the other hand, may decrease thyroidal uptake and increase urinary excretion to abnormally high levels—this phenomenon persisting for days after withdrawal of the drug. Potassium thiocyanate may decrease thyroidal uptake of radioiodine during the time when blood cyanates are elevated, and may increase it after cyanates have disappeared. Thyroiditis may cause an increase or a decrease of iodine uptake depending on factors unknown at present.

Stanley and Astwood[34] have used another approach in diagnosing hyperthyroidism. First, the patient is given an oral dose of a goitrogen, which they believe inhibits the accumulation of organically bound iodine in the thyroid. An hour or two later a tracer dose of radioiodine is given and frequent measurements are made with a Geiger counter over the neck. In the thyrotoxic patient a greater uptake of radioiodine is observed than in the normal subject. Also discharge of radioiodine from the thyroid after administration of thiocyanate under these conditions is more precipitous in the thyrotoxic than in the normal subject.

Myxedema. It is not surprising that patients with myxedema, having little or no functioning thyroid tissue, excrete from 80 to 95 per cent of a tracer dose of radioiodine in the urine within seventy-two hours. Geiger counts over the neck show little or no concentration of radiations in the region. Exceptions may occur in certain goiters with myxedema,[35] or in thiocyanate goiter with myxedema,[36] in which the thyroid is hungry for iodine. Myxedema is usually easy to diagnose if one suspects its presence. There are many patients, however, with low metabolism in whom the thyroid gland is functioning normally but who do not seem to utilize the hormone. These patients have a normal thyroidal uptake of radioiodine when given a tracer dose and thus may be differentiated from patients who have true myxedema.

Radioiodine in treatment of hyperthyroidism. Internal beta radiation to the thyroid by giving radioiodine orally affords a means of delivering a much greater amount of radiation than is possible by roentgen or radium therapy, the dosage of which is limited by radiation damage to the skin. In 1941 Hamilton and co-workers [39] tested the dangers of radiation in dogs and rabbits by giving radioiodine in doses several times that expected for treating human thyrotoxicosis. The thyroid glands were partially destroyed and replaced by fibrous tissue, but the animals did not suffer from any ill effects to the trachea, parathyroid glands, recurrent laryngeal nerves or kidneys. With this information three hyperthyroid patients were treated with I_{131} and remissions were effected. Numerous subsequent studies [37,38] have confirmed this report and some patients now have been observed in remission for seven years or longer.

Soley and Miller [39] and other workers have treated patients of all ages and degrees of hyperthyroidism. At the Mayo Clinic we still consider thyroidectomy as the best form of treatment for uncomplicated exophthalmic goiter and in consideration of possible late harmful effects of radiations we have reserved radioiodine for those cases which are unsuitable for surgical treatment.[40] These include advanced age, serious heart disease, multiple recurrences of goiter, paralysis of the vocal cords, marked sensitivity to iodine making preoperative iodination impossible, co-existent malignant disease outside the thyroid, and very small goiters. We have tried to avoid giving radioiodine to people in the reproductive age in order to avoid genetic effects in descendants. In a few cases we have treated toxic adenomatous goiter successfully but this does not respond as well as exophthalmic goiter.

Therapeutic radioiodine can be given in repeated small doses or as a single large dose. Soley and Miller give an initial dose of 2,000 microcuries of I_{131} and repeat the dose each month until a satisfactory response is made. The single dose which we use is based on the amount of radioiodine required to produce a full therapeutic effect. Although there is an individual variation in response to the same dose, in the usual case a remission will develop when the thyroid collects 250 microcuries of I_{131} per gram of tissue. The dose to be administered is calculated from the results of a tracer dose which shows what percentage of the therapeutic dose will be collected by the thyroid and from an estimation of the weight of the thyroid gland by palpation. On the basis of these calculations the actual dose swallowed has varied from 2,600 to 20,000 microcuries. Urinary excretion of radioiodine after administration of the therapeutic dose is then measured to determine the dose actually received by the thyroid. Within one to three days after administration of the dose the thyroid often becomes slightly tender. Then for about a week the gland becomes firmer and may enlarge somewhat. Thyrotoxicosis may be temporarily aggravated, and the blood sedimentation rate increased. In rare cases transitory radiation sickness and leukopenia may develop. In about two or three weeks after administration of the dose clinical improvement begins with coincident subjective improvement, decrease in size of the goiter, lowering of basal metabolic rate, diminution of pulse rate and elevation of serum cholesterol. Complete remission is usually seen six to twelve weeks after administration of the dose but in a few cases remission has not occurred until six months later.

Of 40 patients whom we treated 35 had a complete remission; 27 obtained remission after one dose of radioiodine while 8 obtained remission after a second dose. In 3 of the 35 cases recurrence of hyperthyroidism developed after a remission had occurred and in 5 myxedema developed. Myxedema was not considered a serious complication since, for most of these patients, it was a great improvement over their former status and it was controlled easily with desiccated thyroid. Unsatisfactory results occurred in 5 cases. In these 5 the diagnosis of hyperthyroidism was equivocal or the dosage was inadequate.

In a few patients who had very severe toxicity we have allowed several days for the radioiodine to become fixed in the thyroid and have then given strong iodine solution (Lugol's solution) to control the toxicity until irradiation has had time to produce its beneficial effect. A few patients experience an increase of exophthalmos after radioiodine therapy. Biopsy of the treated gland reveals fibrosis and diminution of number of follicles, but the epithelium remaining is still hyperplastic, thus indicating that radioiodine does not depress the original stimulus which caused thyroidal hyperplasia.[37] Not enough is yet known about radioiodine in the therapy of hyperthyroidism to enable one to say what its eventual role will be, but the fact that recurrences and myxedema occur with greater frequency after its use than after thyroidectomy suggests that it will not supplant surgical treatment.

Other Treatments of Hyperthyroidism

New treatments for hyperthyroidism have been appearing regularly for many years. In addition to antithyroid drugs and radioiodine several other methods are worth mentioning, although their efficiency is questionable and they have not had sufficient trial for proper evaluation. Thompson [41] considered the role that overstimulation of the pituitary might play in producing hyperthyroidism and treated 43 patients with toxic goiter by irradiation of the pituitary. A permanent remission was produced in about a third of them. Because of the low percentage of cures he did not recommend irradiation of the pituitary as a routine treatment.

The high incidence of hyperthyroidism in women and its frequency of onset at puberty, during pregnancy and at menopause, have led several investigators to try estrogenic substance in treatment of hyperthyroidism. Storck used estrogens as a preoperative medication for thyroidectomy in a few cases and claimed favorable results.[42]

The apparent antagonism of vitamin A and thyroid hormone led Simkins [43] to treat 2 thyrotoxic women with massive doses of vitamin A (200,000 to 400,000 international units daily for six and twelve months respectively). He obtained encouraging results.

Roentgen therapy for hyperthyroidism is still being used but has been supplanted in great part by antithyroid drugs and radioiodine. The surgical technic of thyroidectomy seems to have been perfected and has not been changed in recent years. There has been a gradual improvement in surgical mortality rate as a result of more efficacious preoperative and postoperative care; for example, that resulting from use of antibiotics. As mentioned previously, the use of antithyroid drugs and radioiodine has reduced the surgical mortality rate for hyperthyroidism to almost zero. The successful King operation for paralyzed vocal cords[44] and the partially successful Naffziger operation for malignant exophthalmos[45] are relatively new surgical procedures for handling complications of hyperthyroidism.

CARCINOMA OF THYROID

Incidence rates at necropsy give the misleading impression that thyroidal carcinoma is rare. Studies of surgically removed thyroids give a more accurate picture of the true state of affairs. Surgical exploration of single nodules in the thyroid reveals an incidence of malignant lesions ranging from 8 per cent[46] to 16 per cent.[47] There is no way to predict whether a nodule in the thyroid is malignant or benign. Certainly the discovery of a single nodule in the thyroid, regardless of its size, rate of growth, age of the patient or texture of the nodule, should be regarded with the same seriousness as a nodule in the breast. The incidence of malignant lesions in patients operated on for multiple nodular goiters is 3 per cent[48] to 5 per cent.[49] This factor, along with the tendency to hyperthyroidism and the pressure effects in later years with both single and multiple nodules, is ample reason for surgical removal of these glands.

The recognition that lateral aberrant thyroid tissue found in the neck is actually metastatic from thyroidal carcinoma,[50,51] and the demonstration of the primary site by careful study of the excised thyroid, have changed the incidence figures for the types of thyroidal carcinoma. Nearly half the thyroidal carcinomas removed surgically today are papillary adenocarcinomas. Fortunately these are of low malignancy, usually grade 1 (Broders' method), occasionally grade 2. Most of the thyroidal carcinomas in young people from childhood up are fortunately of the less malignant types. Surgical treatment in these cases is often successful, since metastases are slow growing and are often limited to the cervical lymph nodes, and excision of these local recurrences may be repeated several times without further extension of the growth.

Treatment. If carcinoma of the thyroid is found at operation and extends through the capsule of the gland, postoperative irradiation should be instituted. Since malignant growths of the thyroid gland are sometimes quite radiosensitive, occasional happy results will be obtained from roentgen or radium irradiation.

Treatment of thyroidal carcinoma with radioiodine has been disappointing. Only about 15 per cent of thyroidal carcinomas will concentrate enough iodine to make internal irradiation by orally ingested radioiodine a feasible treatment. Undifferentiated carcinomas without follicle formation do not collect radioiodine, and not all of those carcinomas which are differentiated into follicles and contain colloid will collect amounts sufficient to justify therapy with radioiodine. The uptake of radioiodine by thyroidal carcinoma has been studied by use of the radioautograph.[52] A radioautograph is prepared by exposing photographic film to a slice of thyroid tissue from a patient who has recently ingested radioiodine. Emanations from radioiodine concentrated in the thyroid tissue expose the film, which is later developed. The film is superimposed on a stained microscopic section, and serves as a means of localizing the deposition of radioiodine in the tissue. Another method of study is to place a Geiger counter over areas of metastasis to demonstrate whether appreciable radioiodine is collected by the metastatic tissue.

When large doses of radioiodine are given for carcinoma of the thyroid the normal thyroid collects enough of the dose to destroy it and to produce myxedema. The tumor tissue may then assume thyroidal function and collect relatively large amounts of radioiodine. We have given single doses up to 100 millicuries of I_{131} without producing serious radiation effects to the patient and as much as 40,000 equivalent roentgens have been delivered to tumor tissue.[53] Pain has been relieved and metastatic regions in bone have been seen to diminish in size under treatment and remain stationary for years, but the region still has retained the ability to concentrate radioiodine, thus indicating that viable cancer has persisted. It is too soon to draw conclusions but apparently radioiodine will be useful in an occasional patient with carcinoma of the thyroid who has local extension or metastasis which cannot be removed surgically. Treatment with radioiodine is prolonged and expensive in these patients. Only the rich and the charity patients can afford it. A hopeful possibility exists that radioiodine or another isotope may be combined with a chemical which is concentrated selectively by malignant tissue and will thus afford a means of potent internal irradiation.

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The Use of the Female Sex Hormone Products in General Practice

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THE female sex hormone products are undoubtedly among the most over-used and the most mis-used of our modern therapeutic weapons. Reports to this effect are available [1] and all of us are familiar with innumerable examples. Within the past month at the University Hospital Clinic we have seen one patient with a carcinoma of the fundus who had received estrogens for supposed menopausal symptoms; one patient with an almost complete congenital atresia of the vagina who had received a gonadotropic therapy to "make her menstruate freely"; and during the past three years we have taken two and one-half patients off previously prescribed endocrine products for every one patient we have put on such medication.

Such vigorous over-use of these drugs would not be a serious offense were it not for the fact that most of the drugs at present available are products of considerable potency and strong physiologic action. It is not that one might not do the patient any good; it is that one might do the patient a great deal of harm which makes this a matter of considerable concern.

This over-use of the female sex hormone products arises chiefly because we fail to recall the underlying principles governing our endocrine therapy. The proper clinical use of these products does not rest on memorizing a long list of clinical conditions for which each of the various hormones might be used in a therapeutic role. On the contrary the problem is one of recalling the fact that the principles which govern endocrine therapy in other realms also govern our endocrine therapy in the realm of the sex hormones. Accordingly, the present consideration of the problem turns to a review and reevaluation of the fundamental principles which should guide our clinical use of such therapy. There is nothing new, nothing unusual and nothing startling about these principles. They are well-recognized and well-established, and the only justification for reconsidering them at the present time is the fact that in the press of our clinical work and in the immediate necessity of treating our patients, the principles themselves which should underlie our action and guide our therapy are sometimes forgotten.

THE PRINCIPLES

1. *All hormone therapy is substitution therapy.*

This, of course, is a perfectly obvious statement. It represents merely the positive assertion of the negative truth that no hormone cures. Cures, that is, in the same sense that penicillin will cure pneumonia or gonorrhea. Insulin does not cure the diabetic. The patient remains diabetic throughout this entire life. The condition is, as a matter of fact, incurable. Insulin controls the diabetes and in its actions plays purely a substitute role, replacing a deficiency which the patient has developed.

In this connection it might be well to mention briefly the use of the estrogenic hormones in the management of the patient with carcinoma of the prostate. It is often argued and perhaps correctly, that this particular use of the estrogens violates this first principle. On the other hand, it is a great mistake to use this example as an analogy with our patients in clinical practice. There is a sharp and a distinct difference between making an old man with a hopelessly fatal prognosis comfortable for the remaining years of his life, and treating a patient in the early decades of her life in the same manner. It is true that the management of carcinoma of the prostate with estrogenic hormones represents a violation of this general principle that all hormone therapy is substitution therapy. That single recognized exception, however, has been badly over-used as an argument against the soundness of the principle itself.

2. *All endocrines act on a definite end-organ.*

This again is self-evident and obvious. The use of the term end-organ may perhaps be ambiguous. Insulin acts on the patient's carbohydrate metabolism. The adrenal-cortical hormone acts on the patient's electrolyte metabolism. In these instances it would be better to say that the endocrine product acts on a definite area in the patient's body economy.

It is perfectly true, of course, that this target zone or target organ may be multiple. Nevertheless, it is always definite, and in each instance the action of that hormone on that particular area can be predicted with reasonable accuracy. The effect of progesterone on its target zone, the uterine endometrium, is always consistent and always well-recognized. These are not products of vague action, improving the patient's "general health." These are definite substances having a definitive action at a known target area. With such specific action they should be used definitely to achieve a specific result.

3. *No hormone includes its own gland production as its target area.*

This, once more, is a well-recognized physiologic truth. The myxedematous patient may take thyroid for decades and at the end of that time the patient's own thyroid still remains inadequate. All the thyroid medication that has been administered has not had a beneficial effect, or indeed any significant effect, on the thyroid gland of the myxedematous patient. Similarly the patient with diabetes may receive insulin for her entire life-time, and at the end of that life the pancreas is still as incapable of proper function as it had been previously. The administered hormone has no direct target action on the gland that produced it. To the extent that it improves the patient's general metabolism by replacing the deficiency, and brings the patient closer to good general function, it may indirectly improve the status of the gland of production. But this is an indirect rather than a direct action.

So much then for the principles that must underlie our management of these patients. With those principles in mind as we face any individual patient, there are three questions which we must ask ourselves before we can conscientiously administer hormonal preparations.

The first of these questions is: *Is there an end-organ, other than the gland of production, which is capable of response?* None of us, I am sure, would administer a gonadotropic hormone to a patient who was a surgical castrate. The target area of the gonadotropins is, of course, the ovarian tissue, and it would be folly to administer these hormonal preparations to a patient whose target organs have been removed. Nevertheless, because of failure to ask this question, similar and comparable errors are committed constantly. This question, therefore, must be answered in the affirmative before one can consider the possibility of administering a hormonal product to a patient.

The second question is: *Is there a deficiency?* The deficiency ought to be demonstrated for that particular and individual patient or the condition should be one in which the known deficiency exists and has been demonstrated in other patients frequently enough that it can be accepted. To try to substitute for something that is not missing is not good clinical common sense and this question should be asked with reference to our individual patient and the hormonal product under consideration.

If both of these questions can be answered in the affirmative, then a case can be made out for the use of the hormonal product. However, if both of these questions can be answered in the affirmative then it behooves us to ask a third question, which is: *Is the deficiency physiologic?*

Thus, for example, the postmenopausal woman has admittedly a deficiency of estrogenic hormones. Nevertheless, that deficiency is a physiologic one. She *should* have an estrogen deficiency at that time in her life. Therefore, if this third question is also answered in the affirmative, we must recognize the fact that any correction of the deficiency is contra-physiologic therapy. This does not prohibit endocrine therapy, but it does require that we recognize that our dosages must be small, our duration of therapy must be definitely proscribed and sooner or later we must bring the patient back to the physiologic point which is her proper status.

Now with these questions in mind, let us return to a consideration of the hormonal products themselves and see in what clinical entities it is possible to answer these questions in such a manner as to justify a course of endocrine therapy.

The Gonadotropins

There are, of course, two of these: the follicle stimulating and the luteinizing. Their exact chemical composition is not known but they are aminoids, having a nitrogen atom in their molecule. Their primary source is either pituitary or chorionic. They bear an expiration date and must be stored in an icebox. Sensitivity to them is possible.

The trouble with the clinical use of the gonadotropins lies in our inability to answer the first two questions satisfactorily. Anterior pituitary deficiency states have not been consistently demonstrated in connection with any of the common menstrual or gynecologic syndromes. Indeed in many conditions (the menopause, threatened abortion, some of the toxemias of pregnancy) excess amounts of these hormones have been found. But we face an even greater problem in answering the first question satisfactorily. The human ovary does not constitute a good end-organ of proven response to the therapeutic administration of these extracts. In the postmenopausal period of a woman's life there is no functioning end-organ at all. Gonadotrophic administration in this case would be whipping a dead horse. In the prepuberty years the ovary is not prepared for such stimulation. Here gonadotropin therapy amounts to whipping an immature horse, and might do actual harm. During its functioning years the ovary in the human does not respond as does that of the experimental animal. Thus, no human ovary which has never ovulated has been made to ovulate by these substances. The isolation of these pituitary fractions has proven to be a discovery of more promise than therapeutic worth; to date they have laboratory and research values, more than they have immediate value in the day-to-day practice of medicine.

The Ovarian Hormones

The ovarian hormones are steroids, related chemically to each other and to the male sex and the adrenal cortex hormones. They have been identified chemically and in most cases synthesized. They contain no nitrogen radical, do not need icebox storage, and bear no expiration date. Sensitivity is extremely rare. There are, of course, two fractions, the progestational and the estrogenic.

Progesterone

Deficiencies of this substance are more frequent than with the gonadotropins, and can be more easily determined. If there is a deficiency of progesterone, an endometrial biopsy taken the first day of menstrual flow will reveal a proliferative rather than a secretory endometrium. We are, however, liable to fall into the fallacy of thinking that by correcting the endometrium we have cured the ovary, which is not true. The patient menstruating from a proliferative endometrium can have this histologic picture corrected by the premenstrual administration of progesterone, but the primary fault in the ovary which led to this situation remains unaltered. When combined with estrogenic therapy, progesterone apparently has some value in threatened abortion,[2] otherwise there are no clear-cut and universally accepted indications for it in the female.

In the years before the menarche, there is, of course, a deficiency of the estrogens. This led to the rational of local estrogenic therapy in gonorrheal vaginitis in children. However, the introduction of the antibiotics and sulfonamides have rendered this form of therapy unnecessary and as a result penicillin and the sulfa drugs have removed the last indication for endocrine therapy in childhood.

The postmenopausal patient similarly has a known deficiency of estrogenic hormones. It should be reiterated with reference to these patients that therapy of senile vaginitis, kraurosis vulvae, and so on, with the estrogens is a case correcting a physiologic deficiency. Accordingly, such a deficiency should not be corrected indefinitely; sooner or later, the patient must come back to her proper hormonal level. Small and preferably declining doses for short periods of time represent the ideal program. And it should be stressed that leukoplakia, which is a pre-malignant lesion, is a contra-indication for such therapy.

At the menopause and immediately postpartum we have relative deficiency situations. That is to say, the patient is experiencing a decline in estrogens from a high to a lower level. This justifies the estrogenic suppression of lactation, which is actually, as you know, a suppression of engorgement. The use of estrogens for threatened abortion (with progesterone) and for some of the toxemias of pregnancy are similarly based on the findings of relative deficiency states.

In the menopausal patient, one of the greatest problems facing the practitioner is the fact that this period in a woman's life is one of normal and physiologic transition. One does not "cure" a physiologic period. Nevertheless, in many instances it becomes necessary for us to alleviate all of some of the patient's symptoms or some of all of her symptoms. Such alleviation of the patient's symptomatology may be achieved successfully by non-hormonal methods. Thus the sedatives, the vitamin separations, particularly B and E, small doses of thyroid, may all contribute to the alleviation of symptoms. These together with reassurance from the physician as well as the understanding which the patient merits and the explanations which are her right, will more often than not "cure" the menopause. By and large, it is only after the failure of such methods that it is necessary to resort to the endocrine products, and the patient can make the transition between the two endocrine levels safely and without hormonal interference.

SUMMARY AND CONCLUSIONS

I should like to regroup the material which we have discussed from the point of view of the patient's age and consider, age group by age group, rules of thumb which should guide us in our use of the various hormonal products.

Prior to the menarche: No indication for any hormonal product. The gonadotropins are contra-indicated.

After the menopause: No indication for the gonadotropins of progesterone. Estrogenic therapy contraphysiologic.

The menstruating years (non-pregnant): No convincing and clear-cut indications for the gonadotropins or progesterone. Etrogens rarely indicated.

During pregnancy: No indication for the gonadotropins.

The menopausal patient. The gonadotropins contra-indicated.

All of these conclusions are relatively negative and constitute sensible restrictions in our use of the female sex hormone products. It would be wise, however, to end with a positive statement as our last conclusion:

All hormonal therapy is last-choice therapy.

The diabetic is not placed upon insulin immediately, but is started on a diet, and insulin is resorted to in the event that that diet alone will not control the patient's situation. The same respect for these products should exist in our clinical office therapy as exists with reference to insulin. They should be resorted to when necessary as a last resort, and not administered as the patient walks into the office.

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CIBA AWARD

The Ciba award for meritorious work in endocrinology will again be offered in 1949. This Ciba award will be given in recognition of the accomplishment of an investigator, not over thirty-five years of age, in the field of clinical or preclinical endocrinology. The Ciba award is for $1,200.00. If within two years of the date of the award the recipient chooses to use it to aid in working in a laboratory other than the one in which he is normally located, the award will be increased to $1,800.00.

SPECIAL COURSES SCHEDULED AT UNIVERSITY OF MINNESOTA

The University of Minnesota announces a three-day course in Obstetrics for general physicians to be given at the Center for Continuation Study January 6 through 8, 1949.

A one-week course in Ophthalmology to be given at the Center for Continuation Study has been arranged. The course is designed for ophthalmologists and will be presented during the week of January 24 through 29, 1949.

Pilonidal Disease

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Pilonidal sinus, or cyst, is a congenital defect, in the midline, usually over the sacrococcygeal region, characterized by the formation of a tract which has a tendency to burrow and undergo abscess formation.[4]

The lesion was described first by Anderson [1] a century ago, J. M. Warren [42] in 1854 described two cases. Hodges [17] reviewed the previously reported cases, added one of his own, and suggested the name pilonidal sinus.[22] The word pilonidal means "nest of hair" (Latin) and is the generally accepted term designating the condition, though not all of these lesions contain hair. The Europeans usually refer to this entity as "coccygeal fistula."

Until recent years little attention was directed at this entity. It did not seem to occur often, and there appeared to be no good reason to worry about it. Harvey Stone,[39] in 1924, published a paper wherein he described sixty cases. His report was listened to with skepticism by several experienced surgeons who admitted they had known little or nothing concerning it prior to Stone's address.

But, though it plagued those practitioners who treated an occasional case, it was with the onset of the war years that it became, suddenly, one of the important diseases with which the Medical Corps was forced to cope. The disease was annoying and baffling. Seemingly simple, it resisted the ingenuity of a host of able surgeons, each of whom had his favorite, but sooner or later disappointing, method of treating this apparently trivial lesion.[18] For emphasis, it may be pointed out that, in 1940, in the United States Navy the number of sick days caused by pilonidal disease exceeded those attributable to either hernia or syphilis.[3] The total man days lost from duty in the United States Navy[46] during 1944 and 1945 was more than half a million (530,701). One young man stayed 16 consecutive months in a Navy Hospital cheerfully awaiting healing of an open wound resulting from excision of a pilonidal cyst.[18]

Embryology

It is natural that this singular little anomaly should have aroused curiosity to understand its development. Microscopic study of embryos by serial section has convinced most research workers of the congenital nature of these lesions, and that it originates from ectoderm. But the exact embryologic development has not been pictured conclusively.

Fox [13] and Gage,[14] from independent studies of serial human fetus sections, induced different conclusions.

I. *Fox* decided the cyst was derived from skin ectoderm. He noted during the third and fourth months of embryonic life a process of invagination of the skin surface over the sacrococcygeal area. About the sixth month of intra-uterine life this invagination began to regress. When this ectodermal invagination, instead of completely regressing, persisted into postnatal life it formed the sacral dimple or sinus tract seen in the child or adult.

II. *Gage*, on the other hand, concluded that pilonidal cyst had its origin from a remnant of neurogenic tissue and that the responsible factor was an abnormality in the involution of the distal neural canal. In embryos he found this remnant to assume the character of a cyst-like space, lined by cells and well separated from the skin. During the second half of fetal life these cyst-like structures normally were seen to undergo atrophy.[17] Kooistra,[22] after a similar method of study, found embryologic evidence to support both theories. Those having a neurogenic origin would be represented clinically, then, by subcutaneous cysts without a demonstrable sinus leading to the skin surface. On the other hand, a pilonidal condition that originated by infolding of skin ectoderm would occur as a sacrococcygeal dimple or sinus. When both anomalies are concurrent they would be represented, according to these theories, by the contiguous cyst and sinus which is clinically so commonly seen.

III. *Stone*,[40] in 1931, suggested that this cyst might be a vestigial remnant of a gland analogous to one found in birds at the caudal end of their spine and used for oiling feathers. Stone called it the "preen gland." Others have maintained these glands produce a scent which attracts the opposite sex of the species. Kallet [19] pointed out that glands analogous to the preen gland, and situated in the sacrococcygeal area, are present in all amniots—reptiles, avians, and mammals—and are classified as sex glands. The development of these glands with maturity may be regarded as a secondary sex characteristic. If the parallel of this is applied to humans, analogous remnants (pilonidal cysts) occasionally become activated with the onset of maturity, thus accounting for the limited age group wherein pilonidal disease is encountered.

Neither the preen gland nor secondary sex characteristic theory has found wide acceptance. Other theories have been promulgated but will not be reviewed here.

Anatomy

The majority of pilonidal cysts are simple midline tubular structures. The primary cyst originally is lined by stratified squamous or by stratified cuboidal epithelium quite similar to skin. This original epithelial lining is seldom wholly intact, for when inflammation occurs in the cyst the epithelium desquamates, in part or entirety, and is replaced by granulation tissue. In chronic cases there is a dense inflammatory cell infiltration in and around the cyst.

One or more small openings generally are found in the midline, cephalad to the posterior commissure. If fistulas may be present. Usually these are situated directly lateral to the primary cyst, but they may be any place from the perineal to the lumbar area.

It generally is maintained that sweat and oil glands do not arise from the cyst epithelium. Ferguson and Granet further contend that the pilonidal hair does not grow from the cyst epithelium. They never have found incontestable evidence of hair follicle structure in the wall of excised cysts. Our observations, likewise, have been that hair, when found, always is lying free; and if it protrudes from the lumen it can be drawn forth without the resistance one would expect were it anchored in a follicle. It has been suggested the hairs arising from follicles adjacent to the sinus intrude and advance into the cyst. We have noted one case where this was occurring. Some of the hairs are then broken off and remain within the sinus.

Lateral extensions of pilonidal cysts form when the exudate of infection, being blocked, burrows along the path of least resistance. These tracts extend approximately twice as frequently into the left buttock as the right.

Symptoms

The clinical importance of these cysts arises from the fact that they are prone to become infected, and that once infected they give recurrent trouble. The predominating symptom is pain, which is usually mild. Often there is discomfort only when sitting. Typically, however, there are periodic exacerbations of the pain. Systemic reactions such as high fever, nausea and vomiting are rare. These have occurred in cases when meningitis was a complication. The duration of symptoms will vary with the age of the patient. Those younger than twenty usually have had symptoms less than a year. Those of more advanced years may have had recurrent symptoms from the time of puberty.

Signs

The outstanding signs are:

1. *Abscess formation,* which occurs in 70 per cent of cases that come for treatment.
2. *A sinus of the skin* in the sacrococcygeal region. Sinuses are found in 90 per cent or more of cases. Four out of five of these cases have but a single sinus, situated in the midline, two centimeters or more cephalad from the anus. The remaining case will have multiple sinuses, located in the midline only or associated with lateral sinuses (10 per cent).
3. *A seropurulent watery discharge,* which infrequently may be bloody, and commonly is only of sufficient quantity to cause spotty soiling of the under-clothes.
4. *Hair,* which may be seen protruding from the sinus.

Diagnosis

The diagnosis of pilonidal disease is seldom difficult. A history of recurring pain and discomfort in the sacrococcygeal region, associated with discharge, is suggestive. The presence of a lump or abscess in this region should call the lesion to mind. A careful search usually will reveal one or more characteristic midline sinuses. Lateral sinuses may also be noted. Hair will occasionally be seen projecting out of the sinus lumen. The midline sinuses present in pilonidal disease always course in a cephalad direction when probed. The presence of an abscess in the sacro-coccygeal area associated with one or more midline sinuses is diagnostic.

Pilonidal disease has been reported at levels as high as the cervical vertebrae. Kooistra[23] collected 14 cases where the cyst was found cephalad to the sacrococcygeal area. Three cases of meningitis following acute infection of these aberrant cysts[29,31,23] have been reported.

One case has been reported[36] of a patient who died from meningitis following an acute infection of a pilonidal cyst situated in the sacrococcygeal region. Postmortem examination disclosed direct continuity with a patent and dilated filum terminale which, in turn, was in direct continuity with the central canal of the spinal cord. Malignant degeneration in simple pilonidal disease apparently has not been reported.[45]

Foı a differential diagnosis a number of pathologic conditions must be considered.

1. Fistula-in-ano can be recognized by the caudal direction of its sinus when probed, and by finding the primary opening of the fistula open upon rectal examination.
2. Furuncle and carbuncle do not present the prolonged history of repeated attacks at a constant site; they do not have epithelial sinuses; they usually lie more superficially.
3. Plugged sebaceous follicles, likewise, are more "shallow."
4. Osteomyelitis, tuberculosis, and syphilis can be ruled out by the history, serologic tests, and x-ray examination.
5. Traumatic dermoids and implantation cysts should be excluded by the history and physical examination.
6. Chordomas, teratomas, fetal adenomas and other neoplasms may be considered.

Etiology

Quiescent pilonidal cysts, when exposed to repeated trauma, eventually become painful, tender, and infected. The role of trauma led Buie,[8] from his army experience, to name it "jeep disease." And Ferguson,[12] in the navy, cited the characteristic position of a sailor when sitting on a hard deck, knees drawn up, shoulders braced against the bulkhead, and the entire weight of his body rolling back and forth on the sacrococcygeal area synchronous with the motion of the ship. Hyperhidrosis caused by physical labor, and lack of personal hygiene are further contributing factors. Bacteria are found constantly present in the tissues of the buttocks.[37] When one or all of the triad—trauma, hyperhidrosis, and lack of personal hygiene—are present, acute infection may supervene, and the disease follow.

Incidence

The lesion is more frequent in the male than female. Most observers place the ratio at 3 or 4 to 1. It commonly occurs in persons whose ages range from 20 to 25. The age extremes of our series were 19 and 30. Burns[9] has observed that pilonidal disease is present most often in tall, obese, hairy bodied males; i. e., the so-called pituitary type. Although it is found in individuals of other habitus, the average weight of the patients in our series was 175 pounds, and we believe the majority were more hirsute than is the average male.

Ferguson showed that when incidence was correlated with age and sex, females had an earlier development of symptoms. This possibly has etiological significance, for the female attains puberty earlier in life than the male, which suggests these lesions are stirred into activity by the sex hormones.

The reported pilonidal disease is confined strikingly to the Caucasian race. There has been no report of its occurrence in red, yellow, or brown races. Only a relatively few cases in the Negro have been reported. It would seem probable, however, that it has not been observed in these races for the same reason that it was overlooked so long in the white race, i. e., no systematic search has been made for it. There apparently is no correlation between incidence and nationality. No satisfactory evidence of an hereditary factor has been presented.

Methods of Treatment

A study of publications gives one an accumulation of heterogeneous and conflicting information appurtenant to the correct treatment of pilonidal disease. Each reporting surgeon seems to be literarily, as well as figuratively, "ploughing his own lonely furrow." Certain basic procedures, however, usually are described. Namely:

1. Excision with open packing
2. Excision with partial closure
3. Excision with simple primary closure
4. Excision with plastic primary closure
5. Destruction of tracts with a sclerosing solution
6. Destruction of tracts with x-ray
7. Destruction of tracts with electricity

The majority of surgeons favor hospitalization while treating this disease. Incision and drainage usually is considered the treatment of choice in cases which have an acute infection, excision being advised when the inflammation has subsided. A large group of writers advise excision followed by some form of primary closure. More, however, recommend excision followed by either open packing or partial closure.

1. In the past, the high incidence of recurrence with any operation other than "en bloc" excision and open packing led to almost universal adoption of this simple method. This procedure causes only small loss of days from work (civilian); but the need for repeated postoperative visits and dressings is extensive. According to most reports, about 8 weeks are required for the wound to heal. A broad scar, adherent to the underlying sacrum, without an intervening fat pad is the end result of the open method. This cicatrix is often painful and may break down from the repeated trauma inherent in certain occupations.
2. The advocates of primary closure state, that by its use there results no painful scar; healing time and rate of recurrence are decreased; and that it is better surgery from a technical point to effect healing by primary intention. Actually, this method, designed to lessen economic loss, in most hands "serves only to increase the danger of failure."[34] A high percentage of wound infection results and probably no reduction of the rate of recurrence.
3. Closure of the wound by plastic procedures has been advocated. This, it is claimed, is more in accord with classical surgical principles. However, the procedures promulgated are often so extensive that most surgeons look for less radical means to deal with a condition which seemingly should be readily remediable by simple surgery.
4. A compromise between open packing and primary closure has been extensively utilized, whereby the skin margins of the wound are sutured to the sacrococcygeal ligament or the posterior sacral fascia. This procedure avoids the chief faults of the previously mentioned methods; for the size of the cavity which must granulate is diminished, yet there is provided open drainage for an inevitably infected wound.
5. A miscellaneous group of methods has been devised for ambulatory treatment of the disease. Inorganic chemicals (e. g., mercury bichloride,[2] caustic $AgNO_3$,[10] modified Carnoy's solution,[11] fuming nitric acid [6]), electricity,[29] roentgen therapy,[38,35] and surgical removal under local anesthesia have been tried.
6. Marsupialization will be discussed later.

Recurrences

I. A review of the rate of recurrence in reported series by various authors highlights the poor results frequently obtained. A few noted recurrences in more than 50 per cent of their cases. Many articles purport to show the value of a given method by citing small recurrence rates in series followed 3 to 18 months postoperatively; yet our group contains several who were free of symptoms for more than 18 months after their operation and then developed symptoms.

II.

	Cases	*Recurrence Rate*	
Kleckner[21]*	4,231	1.13%	Open packing (excision)
Kleckner	265	24	Primary closure
McKirdie[28]		65	Open packing (excision)
McKirdie	45	31	Primary closure with drains
Rogers		38	Open packing
Rogers & Dwight	140	1.4	Open packing
Ferguson & Mecray	37	8	Primary closure

Formerly it was believed that incomplete removal of epithelium was the responsible factor in recurrences; and to insure removal of the epithelium, block excision of the cyst with broad margins of normal tissue was advised. Weeder[43] suggested that a portion of the cyst often extended into the sacrococcygeal joint, and coccygectomy therefore would be necessary to effect a cure. Yet, if remaining epithelium causes recurrence, one would expect to find it in the tissue removed at succeeding operations. But epithelial elements are present in only 1 to 10 per cent of such tissue. If Weeder's belief were correct, one would seldom obtain a cure by the methods now used. Coccygectomy might be considered, however, when a periostitis resulting from adjacent infection is the cause of a persistent sinus.

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*Collected data received from questionnaires which were mailed to proctologists.

Rogers, in a series of patients, demonstrated that recurrences were due to infected dead space rather than a residuum of epithelial cyst tissue from the original procedure. Shute[37] found active and virulent organisms in the tissues of the buttocks 1.5 cm. or more from the margins of the infected tissue. It may be speculated that infrequently an acute infection causing a recurrent sinus might develop from this latent source.

Granet and Ferguson have found that most recurrences occur as a sinus which lies just posterior to the sacrococcygeal ligament. The skin and subcutaneous tissue down to this, formerly the seat of the disease, will have healed solidly. They believe recurrence frequently results from a failure to recognize the presence or the importance of the thin posterior sacral fascia that lies ventral to the fatty subcutaneous tissue. This fascia separates the fatty subcutaneous tissue from the sacrococcygeal ligament. Many surgeons, while removing a cyst "en bloc," carry their dissection down through the posterior sacral fascia. The avascular sacrococcygeal ligament then remains as the base of the cavity. It is a physiological maxim that healing of sutured wounds, per primum, is dependent upon a rich vascular bed in both approximated tissues. They state one cannot obtain a firm union when vascular areolar tissue is approximated to the fibrotic, avascular posterior sacrococcygeal ligament. According to their belief, the posterior sacral fascia must be preserved if one is to avoid frequent recurrence.

These recurrent sinuses usually will close spontaneously within a period of two years.

ANESTHESIA

The choice of anesthesia is important. Brockhand and Floyd[7] found infiltration with a local anesthetic increased the incidence of complication, recurrence, and the period of hospitalization. They reported 47 cases wherein spinal anesthesia was used. The postoperative hospitalization of this group averaged 21 days. In contrast, in 116 cases for whom local anesthesia was used, the postoperative stay averaged 47 days. There were six severe infections and five recurrences in the latter group but neither recurrence nor severe infection developed in the group which had spinal anesthesia.

TECHNICAL DIFFICULTY

We have pointed out that operations for pilonidal disease are unsatisfactory when judged by time lost, rate of recurrence, and painful postoperative cicatrix. Operative procedures designed to lessen one unfavorable factor usually increase another. Some of the problems encountered will be mentioned.

1. *Poor Skin Healing.* The Langer lines of stress in the sacrococcygeal area are transverse. Therefore, the usual midline longitudinal incision crosses these lines at right angle. To avoid this technical error a "U" or curved incision has been advised when primary closure is to be made. Several authors recommend that postoperatively the buttocks be strapped together and the patient ordered on strict bed rest in a prone position for seven to ten days. Such a regimen will lessen the effect of skin stress lines and the tonic pull of the gluteal and other muscles which cause stretching and movement of primarily sutured wound edges. However, the excessive heat and moisture resulting from such apposition of the buttocks is detrimental to good healing of the wound lying at the base of the intergluteal fold.

   Other authors recommend that patients be kept prone with buttocks strapped apart and exposed to dry heat to decrease the moisture. This, however, increases tension and movement when the edges have been closed primarily.

2. *Poor Subcutaneous Healing.* The propensity of areolar tissue to degenerate and liquefy following operative trauma or postoperative infection, especially when the fatty layer is thick as it is in this region, is well recognized. Such liquefaction produces dead space in a tissue which has weak defensive powers against infection; serum then accumulates; infection and tissue necrosis ensue; and inevitably there results another draining sinus.

Even though traumatic damage be avoided, it is almost impossible to re-appose, by primary closure, the walls of the cavity resultant from cystectomy so that dead space does not remain in areolar tissue. Consequently, the same chain of events occurs, namely, serum collection, infection, necrosis, and sinus formation.

Many techniques have been tried attempting to prevent the dead space which results when a simple closure is made. For example, the fat over the sacral and gluteal fasciae is undercut to produce thick flaps which are then drawn together by tension sutures to fill in the defect. This usually is supplemented by pressure dressings. The objection to such devices is the poor healing quality of fat when strangulated and devitalized by encircling ligatures or by pressure.

Attempts to close dead space and avoid tension by using several suture layers in the subcutaneous tissue and a pressure dressing maintained for 10 to 12 days have been made but without notable results.

Lateral relaxing incisions, to aid midline approximation of fat and skin without tension and with less necrosis of tissue, have been tried and found wanting. Use of a portion of gluteal muscle to fill in the defect has been proposed by several authors.

Other operators, despairing of closing dead space entirely, have resorted to primary skin grafting (Scarborough) or to the partial closures.

Bowel movements provide the problem of gross contamination for those cases closed primarily. This can be averted, in part, by repeated use of paregoric and restriction to a clear liquid diet for three to ten days.

3. *Poor Scar Formation.* When one removes a large block of tissue from this region and closes the wound primarily, there may be, as a result of the foreshortened tissue, a flattening of the intergluteal fold. A painful scar that is constantly stretched and traumatized results.[25]
4. *Miscellaneous.* Penicillin and sulfonamide drugs have been used extensively but they do not obviate the mechanical factors which cause recurrence.

The secondary lateral tracts pass through subcutaneous tissue which overlies the gluteal muscle. A richly vascular tissue, therefore, is present as a base. These lateral tracts, when opened, heal as well as any cutaneous wound. If pilonidal disease were confined to such areas, no surgical problem of moment would exist.[30]

DePrizio and MacFee, to avoid the difficulties presented by primary closure, advocated block excision of the cyst followed by a partial closure. This method removed the fat pad which protects the sacrum. The scar tissue which fills the defect then lies directly over this weight-bearing point and as a result pain often occurs when sitting. Serious consideration should, therefore, be given before performing block excision if the patient's occupation will cause rough jolting to this area as, for example, trucking or farming.

In the open methods, little attention need be given the bowel habits for the wound will be kept relatively clean if the patient receives daily sitz baths and the dressings are changed after each bowel movement.

The greater reliability of the open forms of procedure is somewhat off-set by the patient's increased loss of time, which necessarily must attend if he is to have correct postoperative care. Recurrences following open operation are caused principally by lack of careful postoperative attention. The postoperative care is equally as important as the operation. One who has followed these cases is impressed by the continual bridging of tissue that occurs. These bridges must be completely disrupted every few days, preferably daily for two weeks, and after this every two to three days until the wound has healed. Otherwise, in a few weeks there is a scar which superficially appears solid but actually is honeycombed with sinuses. Such a scar will inevitably break down shortly after the patient's discharge from the hospital. One of Halstead's basic principles of wound healing stated, in effect, that a chord or bridge of tissue overlying a granulating wound must be severed before healing can be expected.

It has often been submitted that surgical excision may be avoided by utilizing sclerosing substances to destroy the cyst epithelium. In practice, alternating injections and curettages are required, with occasional excision of devitalized skin. Many outpatient treatments are necessary and the end results are not signal. Rather serious complications caused by this type of therapy have been reported. This approach fails to take into account the probability that infected tissue, present in every pilonidal sinus as a result of trauma and infection, rather than the epithelium, per se, causes the acute symptoms.

Smith used roentgen radiation postoperatively in a small series to control infection and to destroy hair growth, which he claimed hindered first intention healing.

In most cases marsupialization is our procedure of choice. We believe we can cure a large percentage of pilonidal disease by using either marsupialization or "en bloc" excision with a partial closure . Observation of recurrences following primary closures made elsewhere vitiated our confidence in such management, though it is possible some method that utilized muscle flaps, e. g., that suggested by Pope,[30] might prove acceptable.

5. *Marsupialization.* We believe, as does Buie,[8] that several advantages are gained by using this marsupialization technique.
   a. The size of the wound is reduced, for little normal tissue is excised.
   b. When healing is complete a sufficient amount of tissue remains to pad the sacrococcygeal region and prevent pressure discomfort.
   c. Recurrence rarely follows when this operation is the original procedure.
   d. No special preoperative preparation is required.
   e. It is not necessary to incise and drain acute abscesses prior to definitive surgery.
   f. Patients are confined to bed only one day.
   g. The postoperative care is simple; no strenuous measures such as "locking the bowel," complete bed rest, special diet, chemotherapy, or pressure dressings are needed.
   h. Postoperative discomfort is negligible.
   i. The period from operation to complete healing is reasonable.
6. *Description.* A grooved director is passed into the cyst. An incision is made the length of the lesion. Secondary sinuses can then be seen entering its floor or walls. Their presence is betokened by a roughening, or granuloma, marring the smoothness of the tract. A grooved director is placed into these lateral tracts and they also are laid open. The wound which results is trimmed as believed necessary. A portion of the cyst wall, or floor, is preserved and the skin edges brought down to it by interrupted No. 0000 silk sutures.

If there has been only slight destruction of the epithelial membrane by inflammation, it will have a histological structure similar to true skin, and is therefore peculiarly fitted for the purpose of the operation. If the epithelial membrane of the cyst was destroyed by infection, reparative processes have supplied scar tissue in its stead, which will be as effective a granulation base as any that develops following excision of the entire wall.

> It is not possible always to utilize the wall of the lesion. The technique must be modified to meet the situation. It may be necessary to suture the skin edges to the fascia of the sacrococcygeal region, the gluteal muscle, the thickened fibrous tissue found adjacent to inflamed pilonidal tissue, or even to fat.
>
> An abscess, when present, should be allowed to become fluctuant. The dome of the abscess is then excised rather than incised. The superficial margin of this pyogenic cavity will often be found contiguous to the skin edge, much as after marsupialization.

Sixty cases were operated upon at this hospital during 1946 for pilonidal disease. Marsupialization of the tract was done in two-thirds of these cases; seventeen had excision and a partial closure; two had a primary closure. Approximately 30 per cent had some form of previous surgery elsewhere. Hair was reported as present in one-third of the cases. Probably it was found but not reported in others. Lateral tracts were noted in one-third of the cases, with the left buttock being involved more than twice as frequently as the right. As many as six midline sinuses were recorded. Methylene blue was used in several cases to outline the tract more clearly. The consensus of proctologists is that this addition is neither necessary nor helpful. Spinal anesthesia was used except when simple drainage was done. No instance was found where the anal sphincter was involved. The postoperative care rendered was not complicated. Daily sitz baths, expunging the tissue bridges with a cotton applicator, and frequent change of dressings constituted the cardinal points. The average hospital stay was 22 days. The patients were discharged with instructions to return at various intervals for further postoperative care dependent upon the condition of their wounds.

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The Rice Diet Treatment in Hypertension as Observed by a Patient

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The number one killer of American adults has long been relegated to the category of incurable diseases, or to those diseases incident to the deterioration of age, or premature aging. Long-established ideas are prone to become statuesque upon a pedestal of permanence and can only be dislodged by cumulative forces of explosive quality. With a desire to contribute to the forces battling inertia, the writer seeks to present information acquired from observation, personal discussion, and from the literature, while a patient in a diet house, locally known as a Rice House, established and operated as a part of the medical service of Dr. Walter Kempner, Assistant Professor of Medicine, Duke University School of Medicine, Durham, North Carolina.

Material published from the Department of Medicine, Duke University School of Medicine, gives substantial evidence of the effectiveness of this treatment. Exhaustive research data and extensive clinical observations have been presented in support of the theory of this treatment and in portraying in detail the method of its management. Some of this material will be condensed in a brief summary in order to represent it for re-evaluation.

Where this treatment has been favorably considered, there has frequently appeared a tendency to tone down the rigor of the regime, or to share credit by modification, thus seriously jeopardizing its successful operation.

The diet is not more rigorous or monotonous than a diabetic diet. Any intelligent person will not find the choice difficult, between a monotonous diet and the progressive crippling of a so-called incurable disease. But short cuts, lack of discipline and non-observance of details are extremely hazardous. "There is no royal road to mathematics," or to recovery or arrestment in hypertensive cardiovascular renal disease.

Regardless of previous examinations or established diagnoses, every person reporting for treatment is given an examination which is a classic of thoroughness. This serves to intercept coincident and complicating pathology and also as a permanent record of the exact condition of the patient at the time treatment was started. This record is frequently referred to and checked against the progress of the patient. The comparison of the first record with subsequent findings, is a source of great encouragement to both the physician and the patient during the long period of very slow evolution of definite physical signs of recovery.

During the course of the treatment, blood pressure readings and auscultative cardiac examinations are made daily. A twenty-four hour specimen of urine is sent to the laboratory twice a week. Examination of these twenty-four hour specimens gives an exact check upon the chlorine output and the cooperation of the patient. Blood chemistry, electrocardiograms, and X-ray examination are made at intervals to record the progress of the patient, or as indicated by the patient's symptoms.

This systematic procedure has accrued and is accumulating a great mass of data, much of which has been tabulated and used to supply the excellent statistical proofs presented in the articles referred to.[8,9,15,16,17] The examination of first record has some interesting variations and will be given in detail. A complete detailed history is taken, followed by a complete physical examination. Colonic irrigations are given, followed by flat scout X-ray pictures of the abdomen and chest. Further X-rays of the chest are taken at six feet distance for cardiac measurement. The legs are X-rayed for visualization of demonstrable arterial pathology. The eye grounds are repeatedly examined, with and without midriotic, and photographed if pathology is noted by any observer. A twenty-four hour specimen of urine is especially studied for output of chloride, sodium, potassium, urea nitrogen, and amounts of albumin per 1000 cc. Renal function is studied by phenolsulfonphthalein percentage output in two hours, and by the Mosenthal dilution concentration test. Complete serological, cytological and chemical examination of the blood is made with emphasis upon N.P.N., urea N, albumin, globulin, chloride, sodium, potassium, calcium, phosphorus, and cholesterol. Electrocardiograms are taken. This minimum examination is expanded as indicated by the history of the patient, or by pathological findings.

After the examination is completed and the data studied, the ambulatory patient is assigned to one of the two diet houses, locally called rice houses. The writer was assigned to the rice house at 1111 North Mangum Street, which is efficiently managed by Mrs. Margaret Newton and Mrs. Flora Barbee. These ladies deserve much credit for the homey, cheerful atmosphere, and for the great variety and excellent preparation of the fruit and fruit juices which vary the diet.

At the rice house some fifty patients congregate to eat their meals and for the daily physical examinations. A few, some eight to twelve of the most incapacitated, are accommodated in rooms at the house and reside on the premises. The others room at nearby houses or hotels, and come to the house for meals and the examinations which are made between 11:00 and 12:00 each day except Sunday, when the examinations are made following the breakfast hour. Two large rooms are set aside for examination and rest rooms. Cots are provided upon which the patients recline for a few minutes before and during examination. Two assistants read blood pressures while the doctor circulates, examining hearts by auscultation, listening to complaints and giving directions. This daily routine is a great morale builder, for it keeps patients satisfied and assured that they are being carefully observed and gives the doctor an opportunity to review the individual problems and needs of each patient.

The psycho-therapeutic atmosphere of the rice house is very helpful. This congregation of "ricers" is a happy, helpful family, bound together by a common malady, a common hope and the same monotony of diet. They are all confident they are going to recover. They quickly regale the newcomer with endless stories of marvelous cures, which are told with the honest conviction of the eye-witness believer.

In his monograph on "Compensation of Renal Metabolic Dysfunction"[9] Dr. Kempner finds 65 per cent of his patients make objective improvement.

At the rice house, the idea persists among the patients that the medical profession is hostile to this treatment. Many of them, far too many of them, have come against the advice of their physician who made some disparaging remark about the worthlessness of "that quack treatment." Such uninformed, ill-advised opinions can only serve to discredit the physician in his own community, beyond whose borders his fame has not spread.

The diet is simple, easily managed dietetically, and no more irksome than any restrictive diet. The American taste buds are so habituated to luxurious variety that any restriction becomes an imaginary hardship. Beef, the favorite food of England and America, would become monotonous, if the menu were restricted to beef. Wild game meat, the staple diet of our pioneer ancestors, could not be tolerated by effete America. The jerked venison diet of our hardy historic explorers and trappers, would choke the throats of our modern American manhood.

The diet is not restricted as to fruit, except nuts, dates and avocadoes, and those fruits adulterated in processing by the addition of substances other than sugar. All fruit juices are allowed in quantity up to 1½ pints, and this constitutes the daily fluid intake. No water or other fluids are allowed. This fruit and fruit juice allowance provides a salutary variety.

The staple of the diet is rice, hence the brevity in designating it as the Rice Diet. One bowl of rice is served at each meal, amounting to 6½ to 10 ounces of dry rice daily, and supplying 700 to 1000 calories. The remaining caloric need is supplied by fruit and 400 to 500 gms. of sugar, making a total of 2000 calories daily intake. The rice supplies 5 grams of fat, and 20 grams of protein, which has been shown to maintain protein balance. No salt is allowed, and tomato and vegetable juices are prohibited, so that the 24-hour intake of sodium is limited to 0.2 grams, and the chloride intake is 0.15 grams.

Fresh, frozen, and canned fruits are used, supplemented by jellies, preserves and marmalades. Some patients found mixing the fruit with the rice made a very palatable mixture, while others preferred to take them separately. Many found lemon juice a good flavoring substance, while others preferred jellies or honey which is also allowed in limited amount of 2 drams a day.

White or brown rice is served, according to the choice of the patient, and wild rice is occasionally offered for variety. The rice is cooked by boiling for 20 minutes, is then drained, washed with hot water and steamed for 15 minutes. For those preferring wet, soft rice, the washing and steaming is omitted. For those who found difficulty in eating the whole rice, it is comminuted or blended to a thin gruel in a mixer. Some patients seemed to really enjoy their rice, and experienced no difficulty in habituation, while others complained inordinately because they seemed to think they were expected to complain, but, under the jovial urging of the hostesses and the older patients, all ate and became habituated to the idea of eating to live instead of living to eat. Only a few patients were unable to tolerate the diet, and had to be given a modified diet with such additions as baked potato, sliced tomatoes, toast and tea. Most of the patients became quite well habituated in three to five weeks and ate their full quota of rice, sometimes asking for a second bowl.

At the end of the period of observation and habituation, usually 100 days, if the patient had made satisfactory progress, the diet was slightly liberalized by the allowance of a small baked potato once or twice a day, or a small tomato, three or four times a week. In some cases, an ounce of lean meat was allowed a few times a week. On each recheck, if the patient's progress and cooperation were satisfactory, there was further liberalization of the diet.

The hostesses were clever in providing fruit variety. For example, for breakfast we had rice, orange juice, prunes, sliced bananas and grapefruit. At times, the grapefruit was broiled which made it delicious. For lunch, there was rice, grape juice, canned apricots, canned figs, and frozen fresh blueberries, or fresh frozen peaches. For the evening meal, rice, grapefruit juice, fresh frozen raspberries, baked pears, and apple-rice pudding. The fruit juice of choice could be had at each meal, and fruit preferences were catered to. Further varieties of fruits and melons were added as seasonal availability of fresh and frozen fruits provided.

Vitamin iron supplement was given in two pills daily containing the estimated minimum requirements of vitamin A, 5000 units; vitamin D, 1000 units; thiamine chloride, 5 mg.; riboflavin, 5 mg.; niacinamide, 25 mg.; calcium pantothenate, 2 mg.; ferrous sulphate, 0.6 gm.

The first three to five weeks were the crucial readjustment and adaptation period with loss of weight, sometimes too rapid, sometimes loss of appetite, and with a feeling of weakness and depletion. During this period, acute vigilance is indicated for early recognition and treatment of developing complications, although, occasionally, complications will appear much later. During this period, the activity was limited to five minutes of leisurely walking, three times a day. As strength resurged, the walking time was increased to ten, fifteen, or twenty minutes, three or four times daily. A routine of nine hours bed rest at night was required, with an additional mid-day rest period of one hour or more. Sun baths were encouraged with extreme caution to avoid burns, which produce toxic response. The night rest of the patients was rather promptly improved by the decrease in urinary output, incident to the limited fluid intake. From an output of several quarts daily and frequent micturation at night, the urinary output on the limited fluid intake is quickly reduced to approximately a quart in twenty-four hours, with a night interval of five to eight hours without disturbance.

For the writer, the first five weeks was a period of gastro-intestinal rebellion, with rather marked psycho-physical depression.

Inadequate investigation, hasty and snap judgment, seem to have contributed largely to the adverse criticism. Some have used the treatment, and have reported failure. Too often, those failing have neglected important details, have tried short cuts, or have tried to treat the patient as the patient wanted to be treated. Rigid discipline and complete cooperation cannot be over-stressed.

Much adverse criticism has centered around the low protein intake as inadequate and detrimental. Clinical observations over long periods support the factual data that these patients are in protein equilibrium.[15]

"It has been argued that this diet is nothing but starvation and that at least the 'wear and tear quota' of 45 Gms. of protein is needed to maintain protein equilibrium. This figure, however, has no other basis than the 7 Gms. of nitrogen excreted per day by people who are fasting and represents only the body's effort to meet its caloric requirements by breaking down its own protein. The daily urinary nitrogen excretion of patients who have followed the rice diet for two months or more averages 2.26 Gms., which means that with a daily intake of little more than 15 Gms. of protein due to the protein sparing effect of carbohydrates, the nitrogen equilibrium is maintained.[9] In fasting, the daily urea nitrogen excretion in the urine is about 5.5 Gms. The average daily urea nitrogen excretion in the urine of patients who have followed the rice diet for two months or more is 1.1 Gms.[9]

"In fasting, the blood urea nitrogen concentration is higher than it is normally. In patients on the rice diet, the urea nitrogen concentration is below the level of normal (average 6.6 mg. per 100 cc. of blood). In starvation, hemoglobin and plasma protein concentrations decrease; in patients on the rice diet, the hemoglobin and plasma protein levels are maintained." [9]

Critics assert that the restriction of fat is too rigid, that reduction of salt has no therapeutic effect,[10–13] that the results obtained are due to rest in bed and psycho-therapy. However, the relation of hypercholesterolemia to hypertensive vascular disease cannot be ignored, and the animal experiments of Grollman and Harrison [14] seem to support the theory that salt "NaCl" concentration is a factor. Whatever the ultimate answer, this fact must be recognized, that the patient is not interested in this academic discussion, but is only interested in results. The rice diet offers a practical outlet by attacking many factors, any of which may be an important or contributing factor. I believe Dr. Kempner is convinced there are many contributing factors centering around or derived from the major fact of disturbed renal metabolic function.

When asked about the effect of the low sodium diet he answered rather emphatically, "There is no doubt that it is beneficial, but it is not adequate alone. There must be total war. Attacking one factor is not enough. Reducing the sodium is not enough; reducing cholesterol is not enough; reducing fluid and amino acids is not enough. Simple reduction is not enough for all factors of renal work must be reduced to an absolute minimum. For example, the reduction of NaCl to 80 mg. per 100 cc. of urinary output is just a beginning, as the restorative action of renal rest does not begin until the NaCl concentration in the urine is less than 20 mg. per 100 cc."

Many notable contributions to the advancement of science have been made by brilliant interpretations of accidental observations. It is interesting to note that the investigation of renal metabolic dysfunction by Dr. Kempner also was initiated by an accidental observation. During research upon renal function by Warburg [1] technique, some slices of renal tissue were left in nitrogen gas for an over-long period by oversight in the laboratory. In testing this tissue to determine if it were still functioning, it was observed that the results of its metabolism were different than that of normal tissue. This initiated a series of experiments testing the metabolism of renal tissue, selectively damaged by exposure to various gases, and by an exposure to an oxygen-free atmosphere. There followed other series of experiments testing the comparative metabolic function of normal and damaged renal tissue under varying concentrations of oxygen, carbon dioxide, sodium bicarbonate, sodium chloride, sugar, amino acid, ketoacids, lactic acid, etc. The result of this exhaustive series of experiments was the building of the concept of renal metabolic dysfunction as a disease entity, which produced toxins and changes in the blood chemistry resulting in pathological response in arteries, heart, and blood pressure. Further search for methods to relieve the overloaded, damaged renal tissue led to diet as the most obvious intermediate answer until renal enzymes or ferments could be procured by extraction or synthesis to bolster failing renal function.

Wider application of the diet is still in the experimental stage, and essentially unreported. I have seen several hypertensive diabetic patients who tolerated the high carbohydrate diet without increase of insulin dosage, and one patient who was able to discontinue the use of insulin and still remain sugar-free. The use of the diet in the treatment of diabetes is now a matter of study at the Kempner Clinic. I am told that many allergies respond to this treatment and that about 30 per cent of cases of rheumatoid arthritis are benefitted.

The diet has numerous side effects of no apparent clinical significance that have not been reported. Many patients have noticed that they do not have to shave or have their hair cut as frequently, and some have noted the slowing of the growth of the nails. Some who had a slow urinary stream, noted improvement, apparently due to decrease in size of an obstructing prostate. One patient noted that a profusion of skin papillomata were decreasing in size and numbers and that several senile warts were fading. If this tendency to retard dermal proliferation is shown to be constant, it may point to blood chemistry factors in proliferative pathology, and hold the key to future research in proliferative malignancies.

SUMMARY

Let us reconsider some of the potentialities of this method of management.

In brief, we recapitulate some of the findings and conclusions reached by Dr. Kempner in his studies of renal metabolic dysfunction in hypertensive cardiovascular renal diseases, and the use of the rice, sugar, fruit diet in the management of these diseases.

Data and logic supporting these conclusions will be found in the literature of reference.[8,9,15,16,17] Objective improvement is noted in 65 per cent of all cases studied including the hopelessly advanced and moribund.

The criteria of objective improvement are: loss of edema; improvement in urine and blood chemistry findings; improvement in electrocardiograph recordings; recession in eyeground pathology and cardiac hypertrophy; and reduction of blood pressure more than 20 points.

The protein requirements are satisfied and the patients are maintained in protein equilibrium.

The diet does not deplete the plasma proteins, and does not reduce the hemoglobin.

Sodium Chloride in the plasma is reduced on the average, .31 mg. per 100 cc.

The diet does not reduce the plasma chloride below the critical level.

Cardiac enlargements, inversion of T_1 and left axis deviation are reversible in patients with acute nephritis, chronic nephritis, and in hypertensive vascular disease.

Non-protein nitrogen was reduced in 66 per cent of cases with renal and hypertensive diseases.

Urea nitrogen was reduced in 90 per cent of cases.

Hypercholesterolemia was reduced in 89 per cent of cases.

Advanced retinopathy improved in 64 per cent of cases.

CONCLUSIONS

1. An epochal contribution to the understanding and management of hypertensive cardiovascular renal diseases has been made by the research and clinical observations of Dr. Walter Kempner.

2. The Rice Fruit Sugar Diet produces salutary objective improvement in 65 to 70 per cent of hypertensive cases.

3. Liberalization of the diet jeopardizes its successful operation.

4. The diet is simple, easily managed dietetically, not overly irksome, and readily habituated by the patient with a will to recover.

5. A cheerful psycho-therapeutic atmosphere is very essential in the period of readjustment and habituation.

6. The Rice Fruit Sugar Diet clears the blood of the constrictor toxic products of incomplete, faulty, overworked metabolic function.

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SMALLPOX DECLINES 50 PER CENT IN UNITED STATES DURING 1947

Smallpox is rapidly approaching extinction in the United States. In 1947, there were only 173 cases of the disease reported in the entire country, as compared with 356 cases the year before and with 11,673 in 1937. This is a reduction of more than 50 per cent in a single year and of more than 98 per cent in a decade. Furthermore, progress in the eradication of smallpox is continuing; in the first 20 weeks of 1948 there were only 45 cases, about one-third the corresponding figure of a year ago.

Rectal Dilators in the Treatment of Constipation

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Chronic constipation is not a disease but a symptom of a functional or organic condition responsible for delay in the transit of food residue through the intestinal tract.

Whitney,[1] in his classification of the etiology of constipation, refers to insufficient residue because of faulty diet or excessive absorption in the cecum, interference with progress by derangement of the motor mechanism—spasm or atony, disorder of the defecation reflex through habitual disregard, or anorectal disease.

Not all patients who complain of constipation actually suffer from this condition. There are many persons in whom evacuation occurring every other day is normal. Hence, before making a diagnosis of constipation it is necessary to determine the character of the stool as well as the frequency of evacuation.

In the physician's practice constipation is attacked from numerous angles and with a wide assortment of dietary regimens and medications. In our practice, industrial and private, which brings us in contact with several thousand pre-employment and routine examinations yearly, we have noted that constipation is one of the most prevalent of all symptom complexes. In checking the records of the physical examinations and histories of these employees and patients, it was noted that constipation in many instances is due to some degree of rectal stenosis, hemorrhoidal complications, improper bowel habits, and(or?) neuropsychogenic factors. In view of the fact that most cases of constipation, other than those due to actual obstruction, can be cleared through establishment of the proper habits, the removal of adverse psychogenic elements, and the relief of rectal stenosis, a clinical study was instituted to determine the efficacy of mechanical dilatation of the anus with rectal dilators in the correction and alleviation of constipation.

The rectal dilators employed in this experiment come in four sizes:*

No. 1—1.3 cm. by 7.5 cm. in length
No. 2—2 cm. by 7.7 cm. in length
No. 3—2.3 cm. by 8.5 cm. in length
No. 4—2.8 cm. by 9.5 cm. in length.

The patient is instructed to use them in progression for fifteen minutes daily, or until defecation is achieved at the same time each day. After warming and lubricating, the dilator is inserted with the patient lying on one side. Each size is used in progression until insertion is easy. This usually is a period of one to two weeks with each size. Results are quite often apparent with the use of the second or third dilator.

The cases studied included two groups—industrial patients and private patients. The nurse in charge of the industrial plants was asked to bring in for study all cases of constipation of which she had knowledge, either from the history and examination records or from personal knowledge. From this group of patients those were selected for treatment who had the type of constipation which it was felt would be amenable to therapy with the dilators; that is, those with some rectal stenosis, hemorrhoidal complications, or constipation of the neuropsychogenic variety. The first step in treatment was to gain the patient's cooperation in the use of the dilators. The patients were instructed to report to the nurse at weekly intervals, and a chronological history of the case was kept by the nurse. Eighty-six industrial workers and thirty-eight private patients were included in this study.

Results

In the group of industrial patients, forty-four improved as a result of the treatment and continued it on their own volition for a period of three months or more. Twenty-four refused to continue treatment after partial or complete failure with the No. 1 and No. 2 dilators, and were unwilling to try the larger dilators. Ten left their employment with the industries concerned, and in ten patients there was no improvement after adequate trial.

In the group of private patients, twenty-one manifested much improvement and continued with the use of the dilators for a period of three months or more, and in ten cases, results were doubtful and treatment was discontinued. Eight patients refused to continue treatment after a short period of time.

Thus, of the total group of one hundred and twenty-nine patients, there were one hundred and one who continued treatment long enough to determine the efficacy of the dilators. Of this group, sixty-five, or 64 per cent, were relieved of their constipation by this method of treatment. A few of these cases treated, chosen at random, are illustrative of the results obtained and the patients' reactions to this method of treatment.

S. S.—nurse: first week, No. 1, no results; second week, No. 2, good results; third week, No. 3, excellent results had no reason to use largest dilator. Comment: low backache present for past two years, completely disappeared.

L. K.—employee: did not use consistently because of fear of dilator; discontinued use.

A. D.—housewife: No. 1, first week, no results; good results with No. 2 second week. Had no reason to use No. 3 and No. 4. Results good.

M. D.—nurse: First week, no results; with continuance of larger sizes results, excellent.

R. B.—salesman, with tabetic gastric crises: No previous normal B.M. Chronic user of cathartics and enemata. Constipatory condition greatly improved with use of dilators, with almost complete elimination of cathartics; no effect, of course, on gastric crises attacks.

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[1] Whitney, E. T.: Chronic Constipation. Bulletin of the New England Medical Center, Vol. 6, pages 170-179, 1944.

*F. E. Young and Company, Chicago.

L. B.—stenographer: would not continue after No. 3. Results poor.

B. A.—assembler: first week, no results; second week, improvement; left employ, lost contact.

H. P.—student: good results with complete course. States "headaches and low backaches present many months, much improved."

M. M.—solderer: results very poor with use of all four dilators. Patient chronic user of cathartics, high degree of nervous tension.

C. W.—assembler: used No. 1, No. 2, and No. 3 with good results; willing to continue on basis of previous improvement.

E. Z.—housewife: used No. 1 and No. 2, excellent results. Headaches, "always present," disappeared.

Discussion

It is difficult to obtain an objective measurement of the results of any method employed in the treatment of constipation. A great deal of the evidence as to cure must be predicated on the patient's analysis and satisfaction with the method used. Constipation is a psychogenic affair in many instances; hence if the patient is relieved of the disorder to his own satisfaction by the use of rectal dilators the treatment can be considered successful. In any event, we are unaware of any other type of treatment for constipation which is as easily carried out, which does not require adherence over a prolonged period of time to a particular dietary regimen, and which does not involve the use of laxatives which are irritating to the intestinal tract and habit forming as well, that will produce more than 50 per cent of satisfactory results.

It is interesting to note that in many cases of constipation which were accompanied by headache, a feeling of distension in the lower bowel, and low backache, appreciable relief was obtained from these complicating symptoms to a degree worthy of the patient's voluntary comment.

Summary

1. In this series of one hundred and twenty-nine patients, on whom the rectal dilator treatment for relief of constipation was used, one hundred and one were cooperative in carrying out the instructions. Of this group, sixty-five were greatly benefited or completely relieved of this disorder, a greater than 60 per cent improvement.

2. Rectal dilatation with rectal dilators was found particularly efficacious in constipation in which there was some degree of rectal stenosis, hemorrhoidal complications, improper bowel habits and neuropsychogenic factors.

3. Treatment with rectal dilators is simple and, after trial, is not unwelcome to the patient in most cases.

4. Mechanical dilatation of the rectum is not a cure-all for constipation, but in cases in which there are no counter-indications, particularly when there is spasticity of anal sphincter, the results obtained would seem to prove the value of this method of treatment.

ADEQUATE FOLLOW-UP OF X-RAY SUSPECTS IS VITAL

A challenging statement has been made that—"with few exceptions, the life or productivity of many *X-ray Suspects* is in the hands of the first physician they either have seen or have been referred to."

Judging from reports by physicians and through other means of obtaining information on the above group of individuals, too many physicians have minimized the importance of the roentgenological findings in persons who are still symptom-free.

According to authority, "surveys have shown that when the diagnosis is based upon the presence of symptoms in patients suspected of having tuberculosis, 87 per cent of the cases will have advanced disease."

Needless to say, if a physician has neglected to carry out a *complete* study to rule tuberculosis in or out, postponement of diagnosis until symptoms occur may result in irreparable damage which might have been easily prevented if diagnosis had been established early and treatment begun immediately.

In some non-tuberculous suspects delay in diagnosis conspired with the immediate cause of death. Post-mortem examinations have confirmed the need for rapid, thorough studies, and consultation services of experienced specialists.

The discovery of individuals with x-ray indications of chest pathology among apparently healthy local adults, will yield the maximum potential benefits to these individuals and to the community only if the physicians, clinics, and health departments accept the above challenge.

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Commissioner of Health

The Changing Concept in Pneumonia

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During the past few years it has become more and more apparent to clinicians, diagnosticians, and teachers of physical diagnosis that their concepts on etiology, symptomatology, diagnosis, treatment, and prognosis in pneumonia and in the diseases germane to it have been undergoing a gradual and progressive metamorphosis.

Like diphtheria and typhoid fever, the pneumonia of classical description appears to be headed for the skeleton's cupboard of old-fashioned and outmoded diseases. It has become a venerable ghost to be resurrected from time to time by medical faculty teachers in lectures concerning primitive diseases that existed in the world before the days of sanitary plumbing, public health propaganda, chemotherapy, and antibiotics.

The day has passed when the faculty lecturer could leisurely select at random from his own teaching service appropriate cases to demonstrate the stages of hyperemia, red and grey hepatization, and resolution in pneumonia. And furthermore, because fewer cases are available for instruction, he tends to bemoan the fact that his students are becoming less proficient and less adept in the examination of the pneumonia chest.

It remains to be seen whether we shall be accused of exaggerating a situation that is not at this time apparent to those who may be the accusers. Nevertheless, our thesis is that pneumonia is undergoing an evolution, and some future medical Darwin must assume the onus of tracing this development to its completion and of presenting it perspicuously to the profession as a completed phylogenetic study.

Pneumonia, from the etiological standpoint is usually classified into four main groups:[1] (a) the specific primary variety produced by a specific microorganism; (b) the specific secondary forms complicating a specific systemic disease such as typhoid fever, brucellosis, rheumatic fever; (c) nonspecific secondary forms complicating debilitating disease, operation, atelectasis; (d) noninfectious varieties caused by chemical or physical agents.

Our observations are concerned with group (a) which accounts for the great majority of all pneumonia. This group may be classified further into two principal subgroups: (1) the virus pneumonias; (2) the bacterial pneumonias.

It is the alteration in recent years, for some reason as yet undetermined, in the relative importance of the viral and bacterial factors in pneumonia which is apparently responsible for the neologistical implications of the word "pneumonia."

Myers [1] has stated that the pneumococcus is by far the most important cause of primary bacterial pneumonia, and that it is responsible for more than 95 per cent of the cases of lobar pneumonia and over 50 per cent of the cases of bronchopneumonia. Though these figures appeared in a publication dated 1947, no doubt they are based on his experiences for some time prior to that date.

Israel and his co-workers [2] recently stated that lobar pneumonia, as they had observed it in the years 1945 and 1946, presented a different picture than in previous years. They suggested that lobar pneumonia is basically a viral process with superimposed bacterial infection merely modifying to a greater or less degree the basic nonbacterial disease.

In Israel's studies two significant differences were noted in the 1945 and 1946 pneumonia cases, as compared with cases in the early portion of the 1936-46 decade. These differences were a marked decline in degree of leukocytosis on admission to hospital, and a retarded or absent temperature response to specific therapy. It must be remembered, however, that such criteria and even roentgenological ones, as well, have been held to be inadequate for the differentiation of bacterial and viral pneumonias.[3] It is of interest to note in this connection that Ziegler and his co-workers [4] have commented on the increasing difficulty which, by and large, is now experienced in clinical practice in the differentiation of bacterial and viral respiratory infections in general. Dingle,[5] too, has recently pointed out that from the standpoint of clinical diagnosis the various common forms of respiratory tract infections present a major problem.

No one can dispute the fact that viral pneumonia, more correctly designated primary atypical pneumonia, cause unknown, is fast assuming a position of paramount importance in the pneumonia picture. It is not within the scope of this discussion to delineate at any great length concerning this disease. The literature is already replete with comprehensive studies about it.

Abernethy [6] has provided us with a concise but complete account of its historical background. Meiklejohn's[7] discussion on its etiology, epidemiology, and laboratory findings, is an up-to-date report on these aspects of the disease that is currently available. It is interesting, particularly to us, to note his suggestion that streptococci may play an etiologic role in some cases of primary atypical pneumonia, for these organisms were found to predominate in the sputum of a number of cases of this disease on our own medical service. The studies, by Dingle and his co-workers [8] of the disease as it occurred amongst soldiers in Louisiana, and by the Commission on Acute Respiratory Diseases [9] in North Carolina, have resulted in considerable advances in our knowledge of it, and have inspired many other investigations of the disease. As yet, however, there is still no uniformity of opinion regarding certain aspects of the etiology of the common form of viral pneumonia.

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Our own experience as Physician, attending Internal Medicine and Communicable Diseases in the University of Missouri Student Health Service, under the direction of Dr. Dan G. Stine, Professor of Medicine, University of Missouri School of Medicine, has permitted us to supervise the diagnosis and treatment of every case of pneumonia occurring in the past two years, amongst a student body of ten to eleven thousand individuals.

As a result of our observations, we have acquired the impression that for the University student age group, at least, the incidence of diagnosed primary atypical pneumonia has increased markedly, while that of pneumococcal lobar pneumonia, specifically, and of lobar pneumonia, generally, has decreased markedly.

The pneumonia cases of the years 1932 and 1933 were arbitrarily chosen for comparison with the pneumonias of 1946 and 1947. Data were obtained from all cases admitted to the University of Missouri Hospitals, private and free services, as well as student.

The following analysis was made of some of the data available in the charts:

Year	Total Hospital Admissions	No. of Cases of All Pneumonia	Pneumonia Pct. of Hospital Admissions	No. of Cases of Lobar Pneumonia	Lobar Pct. of All Pneumonia Cases	No. of Cases of Atypical Pneumonia	Atypical Pct. of All Pneumonia Cases	Avge. WBC on Admission of All Pneumonia	Avge. Period of Febrility of All Pneumonia
1932	2,352	27	1.2	11	41.	0	—	16,600	8
1933	2,031	27	1.3	10	37.	0	—	13,500	9
1946	3,129	32	1.0	3	9.4	16	50.	14,000	5.5
1947	4,322	42	0.97	2	4.7	19	48.	10,500	2.5

These figures confirm a number of ideas medical men have had for the past few years. The incidence of hospitalized cases of pneumonia has decreased. The incidence of primary atypical pneumonia has increased markedly. The incidence of lobar pneumonia has decreased markedly. The weight of the evidence seems to support the hypothesis that there has been an alteration in the relative importance of the viral and the bacterial factors in pneumonia.

Included in the 1947 figures are data from 18 cases of lobular pneumonitis which occurred as complications in 880 instances of influenza during a type A influenza epidemic.[10] Such cases, clinically and roentgenologically, simulated primary atypical pneumonia, and if they had occurred at any other time than during an influenza epidemic, might very well have been diagnosed as such. In this connection, it is interesting to note that Abernethy [6] suggests that many of the so-called influenza pneumonias occurring in 1918, throughout military installations, may have been instances of primary atypical pneumonia. Golden [11] has emphasized the parallelism in morbid anatomy between the pneumonitis associated with atypical pneumonia and the pneumonitis of uncomplicated influenzal pneumonia.

When one bears in mind such facts as those mentioned above, and, too, the fact that primary atypical pneumonia may occur in epidemic fashion, it does not require too daring an imagination to conjecture that perhaps the atypical pneumonia virus, if such it be, is another of the allegedly numerous influenza virus variants. No evidence is available to support such a thesis; on the contrary, the weight of the evidence based on serological studies thus far made, differentiates sharply and distinctly the virus of atypical pneumonia from the virus of influenza.

Generally speaking, atypical pneumonia presents the clinical features of a mild to moderately severe respiratory infection. Approximately one-fifth of the patients become seriously and severely ill. The classical signs of consolidation are rarely noted.[5] The author had occasion recently to deal with a case of atypical pneumonia with solidification of the lung [12] that was severely ill for the first twelve days of hospitalization. The predominating organism in the sputum was a penicillin-sensitive streptococcus; however, chemotherapy and antibiotics apparently had no effect on the clinical course of this case.

Up to the present time, cases of such severity have, fortunately, been the unusual thing. But when one ponders over such problems as mutations and genetic changes in pathogenic and nonpathogenic organisms, modification of virulence of micro-organisms, pleomorphism, constitutional and environmental factors affecting host resistance, variations in disease entities, and the like, one cannot help but wonder what the nature of pneumonia, and, for that matter, other communicable diseases, will be like a decade hence, and ten decades hence.

If it were permissable to adapt a metaphor utilized recently by the Historian Toynbee, one might go on to say, "If pneumonia could be likened to a chariot progressing on a level grade, heading for an unknown goal, perhaps the wheels on which it moves may be regarded as being made up of periodic upsurges of viruses and bacteria. And it looks as if the periodic upsurges, just like the motion of the wheels, may be cyclic and recurrent in nature, while the evolution of pneumonia, like the movement of the chariot, may be in a single continuous line. And (to carry the metaphor further) one should bear in mind that the evolution of pneumonia, like the movement of the chariot, may be accelerated or retarded depending on the obstacles confronting it, chemotherapy and antibiotics acting like ruts in the road, increased organism virulence adding wings to the chariot."

Only when the chariot has attained its goal, shall we be able to comprehend fully the neologism "pneumonia."

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AILMENTS FOUND IN HALF OF "U" CANCER CENTER PATRONS

More than one-half of the 957 Minnesota men and women examined at the University of Minnesota's Cancer Detection Center during the first seven months of its operation were found to have abnormalities requiring medical attention, Dr. David State, director of the center, reported.

Ailments diagnosed in 527 patrons of the center included: 15 definite cases of cancer, 235 pre-cancerous lesions or sores, 131 benign (non-malignant) tumors, 270 non-tumorous but abnormal conditions and 49 suspicious tumors. Some of the patients with abnormalities were suffering from two or even three conditions requiring a physician's care.

. . . MEET OUR CONTRIBUTORS . . .

Allan C. Barnes, M.D., Columbus, Ohio, was graduated from the University of Pennsylvania Medical School in 1937; M.S. degree from the University of Michigan in Obstetrics and Gynecology; Professor and Chairman, Department of Gynecology, Ohio State Medical School; Diplomate in American College of Obstetrics and Gynecology, Member of Central Society for Clinical Research, Sigma Xi.

Mavis P. Kelsey, M.D., Rochester, Minnesota, was graduated from the University of Texas in 1936; Fellow at the Mayo Clinic for two years; Editor of the Air Surgeons Bulletin during the war; specializing in Internal Medicine.

W. E. Morse, M.D., Rapid City, South Dakota, Practicing Physician for 28 years; Member of American College of Surgeons, South Dakota State Medical Association, Black Hills District Medical Association, International College of Surgeons.

Charles E. Stanford, M.D., Minneapolis, Minnesota, was graduated from the University of Wisconsin Medical School in 1934; Clinical Assistant Professor, University of Minnesota Medical School; Consulting Ophthalmologist, University of Minnesota Health Service and State of Minnesota, Bureau Aid to the Blind; American Academy of Ophthalmology and Otolaryngology.

George X. Trimble, M.D., Columbia, Missouri, was graduated from the University of Toronto in 1938; Specialist in Internal Medicine; Physician and Assistant to the Director, University of Missouri Student Health Service; Instructor in Medicine, University of Missouri School of Medicine.

Richard J. Webber, M.D., Minneapolis, Minnesota, was graduated from the University of Minnesota in 1941; Resident in Surgery, Veterans Administration Hospital for 2½ years.

AMERICAN STUDENT HEALTH ASSOCIATION

Eye Health of College Students*

Charles E. Stanford, M.D.
Minneapolis, Minnesota

THE subject, "Eye Health of College Students," at once brings the implication that this is a cause for some concern. In the past a number of statistical studies have been made on visual acuities of students, on how many wore glasses, how many arrived with correctly fitted glasses, how many were fitted by optometrists, how many by ophthalmologists, and how many knew the difference between the two groups of refractionists.

Fortunately, there are no visual acuity requirements for college as there are, for example, in the army, the air corps, the navy and certain industries. All that is required is that the student have vision, with or without glasses, to enable him to hold his own, and, in case he cannot see well enough, special arrangements can be made. So the hyperope, the emmetrope, the myope, the astigmat, the functionally one-eyed and the anatomically one-eyed individual are all found in the same entering class, often taking the same course.

Regardless of the type of eye and regardless of whether glasses are worn or not, it is a rare student who does not, at some time in his college years, have some ocular discomfort and seeks advice if his symptoms are of more than a few days duration. A relatively small percentage experience sufficient change in their refractive errors to cause blurred vision. Whether the symptoms are discomfort or headache or blur, the student usually comes in with the preconceived notion that glasses are the answer to all his troubles.

The group with 20/20 vision make up a surprisingly large proportion of those coming to the clinic. Their complaints are as many and varied, if not more so, than those with less vision. Some, because of the ease with which they could read at any distance in prior years, have never learned themselves, or been taught that a reading distance of 6 to 8 inches requires much more focusing effort than a distance of 14 to 16 inches. So with the longer reading assignments and study hours of college, these people promptly exhaust themselves with their childish reading habits and seek relief. Many are found to have refractive errors so small that correcting lenses have nothing to offer in either eye health, eye comfort or vision. Advice regarding reading habits suffices. Others are found to have hyperopia of a degree that, while the individual is comfortable for ordinary activities, study can be made easier by relieving some of his accommodative effort with glasses. This is the group that raises the percentage of wearers of glasses among college students considerably above the percentage of wearers of glasses in a similar age group not doing so much close work. An interesting side-light on this group is the experience of all refractionists. Scarcely a day goes by without a lady patient in her late thirties or early forties, the pre-presbyopic age, coming in for a refraction with the remark that she used glasses when she was in college or worked in an office, but after marriage and the arrival of a family she had little time for close work and has not used glasses for ten to twenty years. She belonged to this latter group.

Among the 20/20 group and also among those needing glasses for myopia or hyperopia or astigmatism are a few individuals who make such an effort at reading that the best possible correction cannot alleviate their trouble. These are usually the slow-reading people. Refractive errors play very little part in their difficulty and they are referred to the reading clinic.

Visual acuities of less than 20/20 correctable with glasses to 20/20 offer no particular difficulties whether myopic, hyperopic, or astigmatic in type as far as refractions are concerned. In addition to the blur they may have the same symptoms as to 20/20 group. Most of these students are wearing glasses when they matriculate. Others have not realized they have defective vision until it is discovered during the entrance examination.

Substandard vision not fully correctable by glasses is not uncommon. Most of those in this group have substandard vision in one eye only. The causes of the latter are multiple. The amblyopias associated with strabismus, high unilateral hyperopia and astigmatism or high myopia are the most common. When the substandard vision is bilateral, it is usually associated with such conditions as moderate to high mixed astigmatism, to moderate to high hyperopia and hyperopic astigmatism, to congenital nystagmus, to ocular and even to complete albinism.

Students with substandard vision not due to any eye disease but to some of the conditions just mentioned present an interesting study in contrasts. Some are not even aware of the term "visual handicap." Others are, but are strong personalities and easily surmount what to another may be an impossible situation. Let me illustrate.

A few weeks ago the eye report of a young man of 20 years came to my hands. This young man has just finished his course at Faribault. He has been educated there because he has congenital nystagmus and his visual acuity is 20/50 with and without glasses for distance and Jaeger 1 type at 6 inches for near. He has been made to feel handicapped. Now he seeks additional help. It brought to mind a similar case of congenital and hereditary nystagmus—a strong-willed young woman whose best vision with correction was 20/60 for distance and 8-point type (common news print) at 6 to 8 inches for near. She entered the University in 1937, carried more than the required amount of credits, finished her course with no significant change in her vision and took up her vocation of teaching.

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*Presented at the 1948 Conference of the National Society for the Prevention of Blindness, Inc., April 5-7, 1948, Minneapolis, Minnesota.

A second illustration—a young man who had only one eye who signed every test paper with the note "This examination written by a one-eye person." Contrast this with a young man who worked nights in a machine-shop to add enough to his G. I. income for schooling and support of his family. An injury cost him the sight of his left eye. He had to drop school for one quarter. But he came back, finished his course, and is now busy at his vocation.

I cite these cases to show that the greatest handicaps a student has in college is not what happens there. He is an adult and meets changing circumstances without cringing. Yet let a student be imbued with the idea of visual handicap in early childhood and he will have a difficult time in college.

Who sets the stage for this state of mind?

One—Farsighted parents with nearsighted children often have a difficult time understanding why glasses are needed and comment altogether too much about the "bad eyes." The same failure to understand that a child with monocular vision due to any of a varied group of causes can surmount his handicap often causes well-meaning but poorly advised parents to plant the idea of handicap so deeply that it lasts a lifetime.

Two—Refractionists, both medical and non-medical, are too often discouraging when their chief function should be to reassure whenever possible. Scarcely a day goes by without some patient replying to our "What can I do for you?" with "Not much, I guess. I have a bad pair of eyes." And then it is found that while he has refractive error, his vision is excellent with correcting lenses. While I have no statistics to prove it, I believe some of the non-medical refractionists are the worst offenders here, though some ophthalmologists are all too prone to remark, "My, that's a bad pair of eyes," and the damage is done. If a person has impending blindness, he must be taught to face it, but to casually tell some youth and his parents that he has a serious eye condition and will be blind some day when the youth merely has a refractive error in a non-diseased eye is unpardonable. I have known many a youth with three to six or seven diopters or myopia, or a high astigmatic error, to be advised not to go to college, not to take medicine or law or other courses because "your eyes won't stand it." Since when do we have to meet air force visual requirements to acquire an education? or to earn a living?

Three—Naval and air corps examiners did and still do a great deal of harm in their careless and ill-advised remarks to youths who fail to meet the visual standards of those particular branches of service. Just because a youth does not have 20/20 vision without glasses does not give any examiner, whether he be a medical officer or an enlisted man trained to record visual acuities, the right to tell the examinee he is nearly blind and no use to anyone. Lay persons who are taught to record visual acuities should also be taught to make absolutely no comment regardless of the level of visual acuity found.

Even those who should know better in this regard can be serious offenders. I refer to school nurses. I am not saying that they do not do immeasurable good—they do. But they talk too much and too carelessly—well-intentioned, to be sure—but with inadequate background. Probably the fault comes right back to us in that nurses consider 20/20 vision is an absolute must and that if a child does not see 20/20 with his glasses, either his glasses are incorrect, or he is going blind. In any such case in which the nurse is puzzled, she should contact the doctor in the case before emotionally upsetting the child and parents.

A few weeks ago a frantic mother called regarding her young son. It seems a routine schoolroom checkup showed very defective vision. Examination by the school doctor followed; a moderate, but not serious, error was found. However, vision did not improve much with glasses. A complete diagnosis was not made. Yet the school nurse called the mother and among other things told her that the boy must wear his glasses or he would soon be blind and probably would be eventually anyway. The boy has a healthy pair of eyes; in time he probably will not need any glasses. It happened to be a case of hysterical amblyopia due to causes easily remedial.

What has all this to do with eye health of college students? I feel that it has a great deal of importance. The student health service can cope with the common eye problems that present themselves. There are facilities for refraction, for study of any cause of sub-standard vision, for remedy of it if it is remedial. Conjunctivitis, foreign bodies, styes and chalazia present no serious problems in care. There are occasionally less common occurrences such as acute iritis, corneal ulcers, serious eye injuries, but certainly these are individual problems affecting a very small fraction of a per cent of the total student population.

I have questioned others doing eye examinations for the student health service and find agreement on this—that one of the most significant problems in caring for the students' eye needs is the preconceived idea of visual handicap. A group such as this, interested in prevention of blindness, could also do much good in disseminating truths about healthy eyes. Restoration of vision through medical or surgical means is an experience of great magnitude to patient and doctor. Prevention of blindness by education of the public is less exciting, but of even greater importance. Ranking with this should be the promotion of a better understanding concerning what constitutes a healthy, usable pair of eyes.

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Editorial

CONTINUING TRUDEAU'S CRUSADE

During this year's Christmas Seal campaign special attention is given to the 100th anniversary of a great pioneer in the treatment of tuberculosis, Edward Livingston Trudeau, M.D., father of modern sanatorium care for the tuberculous, who was born in New York on October 5, 1848.

When he was still a young man, Dr. Trudeau watched his brother die of tuberculosis and then a few years later, discovered that he too had the disease. In that day tuberculosis was a death sentence. Edward Trudeau went to the Adirondacks to spend the little time he had left in his beloved wilderness. But to his amazement, instead of death, came health and recovery. In 1885 his own thrilling experience led Trudeau to build the first American sanatorium where others might utilize the seemingly miraculous rest cure.

A few years later a group of interested young men decided to form an organization to wage a nation-wide fight against tuberculosis. The group met in 1904 and founded the National Tuberculosis Association and elected Trudeau as the first president.

In his address at the first annual meeting of the organization in 1905, Dr. Trudeau laid the foundation for the vast educational campaign that has gone on through the years. He said, "The first and greatest need (of the tuberculosis campaign) is education: education of the people and through them education of the state."

Trudeau himself did not rest in this fight to control tuberculosis. His small laboratory at Saranac Lake was the first in America devoted solely to the study of tuberculosis. Through his work here he converted many of the incredulous. Physicians who had not believed in the "germ theory" now sent him specimens for diagnosis. Trudeau's untiring work in his little laboratory set the keynote for the extensive program of tuberculosis research which continues to this day.

Modern developments in research, treatment and early diagnosis of tuberculosis were brought to physicians in this region in a short course in diseases of the chest conducted at the University Continuation Center, October 18, 19 and 20. The course was sponsored by the American Trudeau Society and the state Christmas Seal organization under the auspices of the University of Minnesota.

During the past 42 years Minnesota has taken an active part in the tuberculosis campaign. Facts stressed in the 1948 Seal Sale are:

Accomplishments

1. A greater percentage of hospitalized TB cases than any other state in the union. There are more than 2,100 sanatoria beds available for tuberculous patients in the state.

2. A mass X-ray survey now underway to make it possible for every adult in the state to have a chest X-ray in the next few years.

3. The tuberculosis death rate in Minnesota has been cut 82 per cent in the past 42 years.

4. Fourteen counties in Minnesota have been accredited for tuberculosis control. This means that they have a TB death rate of 10 or less per 100,000 and (5) that their high school demonstrated less than 15 per cent reactors among students of the senior class.

6. Over 700 Minnesota schools have been certified for tuberculosis control. Requirements for "A" certificates include: tuberculin testing of 95 to 100 per cent of the children in a school and 100 per cent testing of all school employees.

The Job Ahead

1. TB still kills at the rate of one person every 10 minutes.

2. On the average one person in every 200 to 250 has "active" tuberculosis. There are some 500,000 cases in the United States.

3. In spite of the fact that the national tuberculosis death rate has been forced down 80 per cent since 1904, TB still kills more people between 15 and 44 than any other disease.

4. Tuberculosis annually costs millions of American dollars in the care of the sick at home and in hospitals and in lost hours of work.

Thus it can be seen that now, when the goal of tuberculosis eradication is in sight, is no time for scientists, physicians and laymen to relax their efforts in the war against TB.

NORTH DAKOTA'S DOCTOR OF THE YEAR

Dr. J. G. Vigeland was born in Norway in 1876 and emigrated to the United States in 1895. While working on a farm in Iowa for his board and room, he completed the grades and high school. In 1906 he was graduated from St. Olaf College in Northfield, Minnesota, and later attended the Medical schools of the University of Minnesota and Marquette University, graduating in 1910.

Due to limited means and debts contracted while working his way through school he was unable to complete his full internship so began practicing in Minnesota. In 1912 he moved to Brinsmade, North Dakota, where he has been in active practice since.

The first summer he made his numerous country calls at four miles per hour with a spotted pony and a cart furnished by the local druggist.

Probably the most trying experiences were the hundreds of deliveries in the country, watching and waiting patiently as long as forty hours. This meant hours at the bedside assisting by pulling the patient's hands during pains and after the delivery washing and dressing the newborn infant, being careful not to put the left sleeve of the baby's shirt on first as that meant "bad luck." Many nights were spent sleeping on the floor in a sheepskin coat close to the stove. On one occasion a patient had to be taken ten miles by sleigh to the nearest railroad and then by train to the hospital for a cesarean section.

During the flu epidemic of 1918-1919 he covered more than 4,500 miles in five months with horses. Many times he became lost on the prairies in blizzards and one time he had to walk knee-deep in snow at night to reach a patient when the driver gave up and turned back.

Doctor Vigeland has been very active in church and community affairs. He has been Superintendent of the County Board of Health for the past 27 years and has served as County Coroner and a member of the Insanity Board for many years.

. . . NEWS ITEMS . . .

NORTH DAKOTA

Dr. Livingston closed his office from November fifth to November twenty-ninth. During this time he studied under Dr. George N. Papanicalaou at the Cornell Division of Bellevue Hospital in New York City.

Last Sunday marked 20 years in Hebron for Dr. and Mrs. Weyrens. They came to Hebron in 1928 from Akeley, Minn., where the doctor practiced medicine for a number of years.

Dr. A. J. Gumper was named as Dickinson's city health officer by the commissioners at their regular meeting in October. The position was formerly held by Dr. Sam Chernausek, who has now retired.

Dr. Josephine Stickelberger, 78, the only woman to practice medicine in Benson county, has moved to St. Paul where she will live with a daughter, Geneva. She practiced medicine until about two years ago in and about Oberon. She was born at Cannon Falls, Minn., and left there at the age of 14 to join her mother and brother at Oberon. After several years, she decided to study medicine and after graduating from the University of Minnesota, became the ninth licensed woman physician in North Dakota. At that time she came to Oberon to practice.

Dr. Archie McCannel of Minot was guest speaker at the meeting of the Devils Lake district medical society November 10.

Dr. F. E. Weed of Park River attended the 13th annual assembly and convocation of the International College of Surgeons, U. S. chapter, at St. Louis, Mo. Dr. Weed was selected as an associate fellow of the college and received this honor at the convocation.

Members of the Grand Forks District Medical Society met at 6:30 P.M. November 17 in the Dacotah hotel, according to Dr. L. B. Silverman, secretary-treasurer. Featured speaker at the meeting was Dr. E. M. Hammes, Jr., neurologist from St. Paul. The subject of his talk was "Head Injuries."

Dr. John M. Adams, associate professor of pediatrics, University of Minnesota, Minneapolis, addressed members of the North Dakota Public Health Association and the North Dakota Health Officers Association at their annual banquet October 28.

Also present at the banquet were members of the Northwest District Medical Society, whose regular meeting was canceled to enable members to attend.

Dr. Malcolm McCannel, Minot, president of the district medical society, introduced Dr. Adams. A. L. Bavone, public health association president, who presided.

Sectional meetings occupied the forenoon sessions Friday, with meetings scheduled for sanitarians, laboratory technicians, nurses and health education officials.

Ending the convention Friday afternoon were reports from the sectional meetings as well as an address by Dr. James F. Maddux, surgeon, district psychiatric consultant, U. S. Public Health Service, Kansas City, Mo.

Speakers included Drs. John W. Knutson, Washington, D. C., Seward E. Miller, Atlanta, Ga., R. O. Saxvik, Bismarck; Miss Bertha Allwardt, public health consultant, Bethesda, Md., and H. G. Hanson, former NDAC student, now an executive officer surgeon general, U. S. Public Health Service, Washington, D. C.

SOUTH DAKOTA

Dr. Russell E. Greenfield, Sioux Falls, and Dr. Michael M. Morrissey, Pierre, were notified of their selection as matriculates of the International College of Surgeons, United States chapter. This signal honor was given to the doctors at the 13th annual assembly and convocation of the United States chapter in St. Louis Nov. 15-19.

Dr. Brooks Ranney, whose practice is to be limited to obstetrics and gynecology, in which fields he has completed hospital qualifications for specialty boards, arrived in Yankton in November to become an associate of Drs. Abt, McVay, Livingston and Sattler in the Yankton Clinic.

MINNESOTA

Dr. Jerome T. Syverton of Minneapolis lectured in Madison October 25. Dr. Syverton is Professor of Bacteriology and Immunology at the Medical School of the University of Minnesota and his subject was "Interference Phenomena in Viral Infections."

Dr. C. Anderson Aldrich, Mayo Clinic staff member and director of the Rochester Child Health Institute, has been honored by being given the Lasker award for outstanding contributions to the education of the physician in the psychologic aspect of the practice of medicine.

Dr. John A. Lepak of St. Paul was elected president of the Minnesota Society of Internal Medicine at its fall meeting in Rochester on October 18. Other officers are Dr. Fred Schaaf, Minneapolis, vice president; Dr. A. E. Brown, re-elected secretary-treasurer.

Dr. Edward J. Baldes of the Mayo Clinic was one of two men honored by President Truman at a school on problems of conversion to a wartime economy in St. Paul on October 18. Certificates of merit were awarded Dr. Baldes and Dr. Bryce L. Crawford, Jr., of the University of Minnesota. The Rochester scientist aided in development of aviation medicine, while Dr. Crawford contributed to a rocket development.

Dr. C. C. Craig has been appointed International Falls health officer. He succeeds the late Dr. M. E. Withrow.

Dr. S. A. Slater, medical director of Southwestern Minnesota sanatorium at Worthington, was presented with a certificate of achievement by the Minnesota Public Health Association for "outstanding contributions in tuberculosis control," at the recent meeting held in St. Paul.

Dr. James Blake, 76 year old physician, was honored by Hopkins, where he has been a general practitioner for many years, at a dinner on October 31.

Dr. Charles L. Scofield, 83, pioneer physician, was awarded an honorary membership in the Minnesota Public Health Conference. He was awarded one of the two honorary memberships given each year for distinguished service in the interest of public health. Dr. Scofield has practiced medicine in Minnesota for 62 years and now lives in retirement in Benson.

Dr. John Lowman, Pipestone, was elected president of the Southwestern Minnesota Medical Society at the annual meeting held recently. Dr. Gerrit Beckering, Edgerton, was named president-elect and Dr. C. J. Pankratz, Mountain Lake, vice president; Dr. B. O. Mork, Jr., Worthington, re-elected secretary-treasurer.

Dr. L. Sogge, genial, kindly Windom physician and dean of the Cottonwood county medical profession, was highly honored when he was nominated by the Southwestern Minnesota Medical Association as a candidate for United States "General Practitioner."

The Freeborn County Medical Society selected Dr. F. W. Calhoun's name as the outstanding general practitioner of the year from Freeborn county to be submitted to the American Medical Association's search for the outstanding man of the nation in that field. Dr. Calhoun has practiced 41 years.

OBITUARIES

Dr. R. R. Stevenson, Sioux Falls, South Dakota, a practicing physician for 50 years, died October 25.

Dr. George Boody, Sr., 93, a veteran St. Paul physician, died November 11.

Dr. William H. Onstine, 86, Moorhead, Minnesota, a veteran physician, died November 8.

Dr. Frank E. Griswold, 74, a retired Hoffman, Minnesota, physician, died November 1 in Minneapolis.

Dr. LeRoy E. Doolittle, Duluth, Minnesota, 65, well-known pediatrician, died November 9.

Dr. Louisa E. Boutelle, 62, former Minneapolis city physician, died in November at Cherokee, Iowa.

Dr. J. Arthur Johnson, 54, St. Paul, Minnesota, who has been associated with the Earl Clinic since 1928, died November 10.

Dr. Gardner Reynolds, 50, St. Paul, a specialist in roentgenology, died October 16.

Dr. Alphonse E. Walch, 41, Minneapolis, Minnesota, a specialist in Internal Medicine, died November 14.

Dr. Earl F. Jamieson, prominent Brainerd, Minnesota, ear, nose and throat specialist, died October 19.

Dr. William C. Gulde, who has practiced medicine in St. Cloud since 1910, died October 28.

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Minneapolis Academy of Medicine
North Dakota State Medical Association
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